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Fish Survey of S. E. Clayoquot Sound Streams, Vancouver Island

T. G. Brown, B. C. Andersen, J. C. Scrivener, and I. V. Williams

Department of Fisheries and Oceans
Biological Sciences Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

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T. G. Brown, B. C. Andersen, J. C. Scrivener, and I. V. Williams

Department of Fisheries and Oceans
Biological Sciences Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

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PREFACE

This survey was conducted in-part, to support a data base of Clayoquot Sound Streams (Brown et al. 1987b). The data base contains a more detailed description of the physical characteristics and logging cut histories of many of the watersheds examined. Information obtained from the data base and used in this report includes: dominant biogeoclimatic varient, stream gradient, stream order, and watershed orientation (see Figure 5 and Table 3). The logging history of each watershed was also obtained from Brown et al. (1987b) and from forest cover maps. A similar survey of twenty-one Barkley Sound streams was completed in spring 1987 (Brown et al. 1987a).

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ABSTRACT

Brown, T. G., B. C. Andersen, J. C. Scrivener, and I. V. Williams. 1989. Fish Survey of S. E. Clayoquot Sound Streams, Vancouver Island. Can. MS Rep. Fish. Aquat. Sci. 2021: 71 p.

Minnow traps were used to capture juvenile salmonids from six locations in each of twenty-three S. E. Clayoquot Sound Streams. At each location the environmental features were noted, the length and weight of all captured juvenile coho were recorded, and scales were obtained for salmonid age determination. Juvenile coho catch/effort, mean length of one year old coho, and percent two year olds were calculated for each stream surveyed. The mean catch at each location was correlated to various environmental features such as: dominant biogeoclimatic variant, gradient, stream order, stream orientation and stream location. The mean catch at each location was also correlated with vegetation type, vegetation age, percentage in-stream cover, cover type, and substrate type. Few results were statistically significant because catches and age compositions were highly variable and sample sizes were small.

RÉSUMÉ

Brown, T. G., B. C. Andersen, J. C. Scrivener, et I. V. Williams. 1989. Fish Survey of S. E. Clayoquot Sound Streams, Vancouver Island. Can. MS Rep. Fish. Aquat. Sci. 2021: 71 p.

Des nasses à vairons ont servi à capturer des salmonidés juvéniles dans vingt-trois cours d'eau du sud-est du bras Clayoquot, dans l'île de Vancouver, en six endroits dans chaque cours d'eau. À chaque endroit, les auteurs de l'étude ont déterminé les caractères du milieu ainsi que la longueur et le poids de tous les saumons coho capturés et prélevé des écailles pour établir l'âge des sujets. Pour chaque cours d'eau visité, ils ont calculé l'effort de capture des jeunes coho, la longueur moyenne des sujets d'un an et le pourcentage de sujets de deux ans. La capture moyenne à chaque endroit a été corrélée avec diverses caractéristiques environnementales, telles que la variante biogéoclimatique dominante, le gradient ainsi que l'orientation et la position du cours d'eau et la catégorie auquel il appartient. Elle a aussi été corrélée avec le type et l'âge de la végétation, le pourcentage de la couverture végétale immergée et le type de couverture végétale et de substrat en présence. Peu de résultats sont significatifs du point de vue statistique étant donné que les captures et leur composition par âge étaient très variables et que les échantillons étaient petits.

INTRODUCTION

There has been considerable speculation as to the relationship between a watershed's logging history and its capacity to produce coho salmon (*Oncorhynchus kisutch*). Each stream has unique habitat features which ultimately dictate the number of juvenile salmonids residing within it, their age distribution, and their size. This survey was conducted in-part to examine the relationships between a watershed's cut history and the status of its salmonid population. The variability in juvenile salmonid numbers relative to stream habitat characteristics such as; percent instream cover, riparian vegetation age and substrate type were examined.

This survey was also conducted in-part to gain specific on-site information which could support the Clayoquot Sound fish/forestry data base (Brown et al. 1987b). During the course of this survey 7 of the 34 streams listed in the data base were visited and the validity of information checked. This survey and the survey conducted in Barkley Sound the previous spring (Brown et al. 1987a), were viewed by the authors to be precursors to a more detailed synoptic survey of west coast streams scheduled for the following years. The design of any synoptic survey conducted in the future should benefit from the on-site information gained during these initial surveys.

METHODS

Twenty-three streams in S.E. Clayoquot Sound were surveyed from March 27 to April 10, 1988 (Figure 1). All streams were sampled within a main-channel section above salt-water influence. Access to the majority of the streams surveyed was by small boat and weather conditions influenced both the date of sampling and selection of streams which were sampled.

Each stream was sampled for fish at six separate sites with six minnow traps per location. The minnow trapping procedure was as described by Brown (1985). Traps were baited with a spoonful of canned herring held within a perforated plastic bag. All traps were placed in locations most likely to contain rearing salmonids and were left for 24 hours to attract fish.

Juvenile salmonids were sampled in six non-randomly selected sites in each stream. Sites were chosen in which the investigators felt that the probability of fish capture was highest. The values of catch/area trapped (Table 1) are clearly underestimates of actual densities (Brown et al. 1987a), however these values should represent an index of fish abundance for the stream reaches surveyed.

A description of the general habitat characteristics (riparian and in-stream) and a measure of the site's dimensions (used to calculate area and volume of pools in which traps were placed) was recorded at each of the six sites for each of the watersheds surveyed (Appendix I). All fish captured at each of the sites were identified as to species. For all salmonids captured fork length was measured and from a representative number of each salmonid species, weight was measured and a scale was taken for age determination. Catch by species is summarized in Appendix II. For each of the watersheds surveyed; coho length-weight data was summarized (Appendix III), catch/effort for each species was calculated (Table 1) and mean length by age was estimated (Table 2).

STANDARDS USED

At each of the sites sampled, the following information was recorded.

1. **Date:** Date of trap removal.
2. **Site:** Numbered from 1 to 6, where 1 is the lower site and 6 is the upper site.
3. **Area:** Wetted surface trapped (m^2).

4. **Volume:** Water volume trapped (m^3).
5. **Vegetation:** Type of stream-side vegetation which might influence a site's character.
6. **Veg-Age:** An estimate of the age of surrounding vegetation, since harvest. All old-growth was recorded as "100".
7. **Substrate:** The dominant substrate types, where "sand-gravel" represents a site which is composed mostly of sand with some gravel, while "gravel-sand" represents a site composed primarily of gravel with some sand.
8. **Habitat Type:** A descriptive term which characterizes the dominant in-stream cover.
9. **Percent Cover:** A visual estimation of instream cover relative to total area trapped.
10. **Coho:** Coho salmon juveniles.
11. **Cut:** Cutthroat trout (less than 180 mm).
12. **Rbt:** Rainbow trout or steelhead juvenile.
13. **Alut:** Aleutian sculpin (Cottus aleuticus).
14. **Aspr:** Prickly sculpin (Cottus asper).
15. **Misc.:** Incidental catches.
16. **Comment:** Common name of "Misc." species.

RESULTS AND DISCUSSION

Results obtained during this survey, emphasize the high degree of variation among streams located within even a narrow geographic range (S.E. Clayoquot Sound, see Figure 1). Catch/effort (Figure 2), coho age structure (Figure 3), mean length of coho one year olds (Figure 4), and salmonid species composition (Table 3) were examined and these variables were related to general watershed characteristics (Table 4) and site specific features (Appendix I). When data obtained from Barkley Sound in spring 1987 (Brown et al. 1987a) was

combined with data obtained during this survey, it was possible to examine salmonid population characteristics relative to four cut history types (Table 5).

Mean coho catch/effort obtained during spring 1988 in S.E. Clayoquot Sound (0.045 coho catch/m^2) was similar to that obtained in Barkley Sound (0.038 coho catch/m^2) during spring 1987 (Brown et al. 1987a). The greatest coho catch/trapping effort (Table 1; Figure 2) was obtained in Warn Bay Creek (0.36 coho/m^2 trapped). The next highest values were obtained in Unnamed (N49 11.4 W125 37.5) at 0.12 coho/m^2 and in Sutton Mills at 0.09 coho/m^2. No juvenile coho were obtained from 3 of the 23 streams surveyed.

The greater juvenile coho catch/effort noted in recently harvested watersheds (Table 5) had been anticipated from Carnation Creek studies (Scrivener and Andersen 1984), but our measured results may have been an artifact of our sampling methods. Fish in recently logged watersheds may have been distributed differently from those in unlogged watersheds, due in part to differences in cover availability, thus non-randomly selected sites may have biased the results. Warn Bay Creek (recently logged) had by far the greatest catch/effort and when this one creek is excluded the catch/effort is similar for each of the cut history types (Table 5).

Comparison of coho catch/effort with various habitat types did not yield any statistically significant results. The high proportion of the total catch obtained from one river system (Warn Bay, 30% of total catch) reduces our confidence in reporting any trends noted. Catch was not correlated with biogeoclimatic variant, stream order or watershed orientation (Figure 5). The catch did appear to decline as stream gradient increased (Figure 5) and increased as percentage instream cover increased (Figure 6). The catch was slightly higher in recently logged watersheds (1-10 years); clearcut and alder banked sites did yield more fish/site than sites with old-growth cover (Figure 6). There was no clear relationship between catch and either

instream cover type or substrate type (Figure 7). However, those sites with the more complex habitat (debris jams and root-masses) supported more coho than exposed sites (boulder, single logs, undercut banks, riparian brush and uncovered pools).

Only 19 of 377 (or 5.0%) of the juvenile coho captured were 2 year olds (Table 2; Figure 3). This is similar to a value of 8.1% obtained during the previous spring in Barkley Sound (Brown et al. 1987a). The greatest number of 2 year old coho, 6 of 19, were obtained in Unnamed (N49 11.4 W125 37.5) which flows into the head of Irving Bay Cove. The section of this creek sampled (the lower half) flows through old growth forest, however the upper portion of this watershed had been harvested the previous year.

It had been observed that the percentage of a juvenile coho population that were 2 year olds declined following logging (Hartman et al. 1987, Holtby 1988) and we hypothesised that following canopy closure the percentage of the juvenile coho population that were 2 year olds would return to pre-logging levels. A significant relationship existed between the number of two year old juvenile coho and harvest history (Table 5; Chi Squared, $X^2 = 17.9$, $P < 0.01$). Unlogged streams had 3 times more 2 year old coho (29/233) then did logged streams (23/553). This result supports earlier studies (Hartman et al. 1987, Holtby 1988), however the anticipated return to pre-logging levels of 2 year olds in established second growth stands was not evident (Table 5).

The mean fork length of 1 year old juvenile coho for all the creeks surveyed in 1988 was 80.1 mm, which is slighty smaller than the mean fork length of 82.6 mm measured in 1987 (Brown et al. 1987a). Two streams had fish significantly smaller than the survey mean length, Warn Bay at 74.6 mm and Unnammed (N49 12.6 W125 45.1) at 74.8 mm (Table 2, Figure 4). Five streams contained 1 year old

juvenile coho with a mean length significantly greater then the survey mean length; Staghorn at 98.2 mm, Unnamed (N49 4.4 W125 32.5) at 97.9mm, Unnamed (N49 16.0 W125 43.5) at 87.9mm, Tranquil at 87.3 mm, and Bedwell (2.0km) at 84.6 mm.

Following logging at Carnation Creek, the mean size of coho smolts increased (Holtby 1988). We hypothesized that juvenile coho fork lengths measured in the recently harvested watersheds examined during this survey and in the previous survey (Brown et al. 1987a), would be larger than those sampled from unlogged systems. This trend was clearly evident (Table 5), however a significant difference was not obtained (Kruskal-Wallis H test, $H = 7.7$, $0.05 < P < 0.10$). An anticipated return to smaller sized juveniles within streams bordered by established second growth vegetation was not evident.

The abundance of the three salmonid species captured during this survey varied relative to stream order and stream gradient (Table 4). Analysis by contingence tables and Chi-Squared tests indicated a number of significant differences. Juvenile coho were more plentiful in 0 to 1% (low) gradient ($P < 0.001$), third and fourth order ($P < 0.01$) streams. Cutthroat troat dominated in 4 to 5% (high) gradient ($P < 0.001$), second order ($P < 0.001$) streams. The total number of rainbow trout captured was small ($n = 37$) and they were more abundant in 2 to 3% gradient ($P < 0.05$), third and fourth order ($0.05 < P < 0.10$) streams.

The sculpin catch (total of 487) was dominated by Prickly sculpin (Cottus asper) and only a few (45) Aleutian sculpin (Cottus aleuticus) were captured (Table 3). C. asper catch was greatest in third and fourth order ($P < 0.01$), 0 - 1% gradient ($P < 0.01$) streams (Table 4). Although, C. aleuticus catch was not significantly different, catch was greatest in second order streams with 4 - 5% gradients.

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Table 1. Catch summary relative to wetted surface area trapped.

NO.	NAME	COHO NO/SQ.M	COHO SD	CUTTHROAT NO/SQ.M	CUTTHROAT SD	RAINBOW NO/SQ.M	RAINBOW SD	ASPER NO/SQ.M	ASPER SD
1	BEDWELL RIVER (2.0 km)	0.046	0.084	0.000	0.000	0.003	0.004	0.021	0.021
2	BEDWELL RIVER (4.5 km)	0.043	0.067	0.000	0.000	0.021	0.026	0.040	0.039
3	BEDWELL RIVER (PENNY CR.)	0.037	0.043	0.000	0.000	0.015	0.016	0.012	0.014
4	BEDWELL RIVER (WALLBASE)	0.037	0.052	0.000	0.000	0.000	0.000	0.083	0.082
5	KOOTOWIS CREEK	0.066	0.034	0.000	0.000	0.003	0.007	0.078	0.049
6	LOST SHOE CREEK	0.032	0.025	0.000	0.000	0.029	0.033	0.000	0.000
7	MURIEL CREEK	0.000	0.000	0.009	0.007	0.000	0.000	0.057	0.067
8	SALMON CREEK	0.011	0.008	0.053	0.068	0.000	0.000	0.000	0.000
9	STAGHORN CREEK	0.007	0.005	0.011	0.018	0.000	0.000	0.069	0.043
10	SUTTON MILLS CREEK	0.092	0.127	0.116	0.107	0.000	0.000	0.084	0.067
11	TRANQUIL RIVER	0.010	0.008	0.000	0.000	0.000	0.000	0.053	0.036
12	UNNAMED (N49 10.6 W125 41.8)	0.047	0.053	0.245	0.126	0.000	0.000	0.023	0.037
13	UNNAMED (N49 10.8 W125 44.7)	0.007	0.008	0.066	0.054	0.000	0.000	0.005	0.008
14	UNNAMED (N49 11.4 W125 37.5)	0.117	0.096	0.092	0.155	0.000	0.000	0.053	0.089
15	UNNAMED (N49 11.5 W125 47.7)	0.028	0.023	0.019	0.015	0.000	0.000	0.015	0.021
16	UNNAMED (N49 11.6 W125 37.4)	0.000	0.000	0.086	0.030	0.000	0.000	0.013	0.019
17	UNNAMED (N49 11.6 W125 44.9)	0.000	0.000	0.087	0.096	0.000	0.000	0.008	0.018
18	UNNAMED (N49 12.6 W125 45.0)	0.021	0.020	0.016	0.011	0.013	0.022	0.042	0.052
19	UNNAMED (N49 13.3 W125 45.1)	0.001	0.002	0.029	0.023	0.000	0.000	0.002	0.005
20	UNNAMED (N49 16.0 W125 43.5)	0.030	0.023	0.030	0.011	0.003	0.006	0.029	0.065
21	UNNAMED (N49 4.4 W125 32.5)	0.027	0.018	0.014	0.020	0.000	0.000	0.054	0.052
22	UNNAMED (N49 4.9 W125 33.6)	0.026	0.040	0.054	0.035	0.000	0.000	0.185	0.240
23	WARN BAY CREEK	0.357	0.177	0.009	0.015	0.017	0.012	0.158	0.126

Table 2. Age and mean length of juvenile coho salmon obtained from scale analysis.

NO.	NAME	CATCH	% YR2	MEAN LENGTH N1	YR1	SD1	N2	YR2	SD2
1	BEDWELL RIVER (2.0 km)	43	4.7	41	84.6	11.1	2	118.0	
2	BEDWELL RIVER (4.5 km)	16	0.0	16	83.1	9.4	0		
3	BEDWELL RIVER (PENNY CR.)	19	0.0	19	82.8	6.7	0		
4	BEDWELL RIVER (WALLBASE)	11	0.0	11	80.3	10.8	0		
5	KOOTOWIS CREEK	18	0.0	18	83.8	6.4	0		
6	LOST SHOE CREEK	9	0.0	9	77.3	8.9	0		
7	MURIEL	0		0			0		
8	SALMON CREEK	6	16.7	5	71.6	8.4	1	97.0	
9	STAGHORN CREEK	6	0.0	6	98.2	13.2	0		
10	SUTTON MILLS CREEK	26	0.0	26	79.4	9.2	0		
11	TRANQUIL RIVER	13	7.7	12	87.3	8.3	1	101.0	
12	UNNAMED (N49 10.6 W125 41.8)	13	15.4	11	81.1	7.9	2	103.5	
13	UNNAMED (N49 10.8 W125 44.7)	5	0.0	5	81.6	9.9	0		
14	UNNAMED (N49 11.4 W125 37.5)	19	26.3	13	84.5	15.6	6	110.0	7.3
15	UNNAMED (N49 11.5 W125 47.7)	21	4.8	20	77.0	8.8	1	109.0	
16	UNNAMED (N49 11.6 W125 37.4)	0					0		
17	UNNAMED (N49 11.6 W125 44.9)	0					0		
18	UNNAMED (N49 12.6 W125 45.0)	8	0.0	8	74.8	5.6	0		
19	UNNAMED (N49 13.3 W125 45.1)	1	0.0	1	74.0		0		
20	UNNAMED (N49 16.0 W125 43.5)	9	11.1	8	87.9	7.8	1	96.0	
21	UNNAMED (N49 4.4 W125 32.5)	12	25.0	9	97.9	6.4	3	111.0	13.5
22	UNNAMED (N49 4.9 W125 33.6)	6	0.0	6	75.8	13.4	0		
23	WARN BAY CREEK	114	1.8	112	74.6	12.9	2	112.5	

Table 3. Fish catch, juvenile coho age structure, and watershed features.

		CATCH						WATERSHED CHARACTERISTICS				
	NAME	COHO	%YR2	CUT	RBT	ASPR	ALUT	BIO	ORDER	GRAD	HARVEST	ORIENT
1	BEDWELL RIVER (2.0 km)	43	4.7	0	2	16	1	Hb1	6	1	35	E-W
2	BEDWELL RIVER (4.5 km)	16	0.0	0	8	19	2	Hb1	6	2	35	E-W
3	BEDWELL RIVER (PENNY CR.)	19	0.0	0	6	5	0	Hb1	3	2	35	W-E
4	BEDWELL RIVER (WALLBASE)	13	0.0	0	0	55	0	Hb1	3	0	60	E-W
5	KOOTOWIS CREEK	18	0.0	0	1	17	7	Hd1	4	1	50	E-W
6	LOST SHOE CREEK	9	0.0	0	8	0	0	Hd1	3	1	40	E-W
7	MURIEL CREEK	0		6	0	28	0	Hd1	3	0	15	N-S
8	SALMON CREEK	6	16.7	15	0	0	0	Hd1	3	1	8	E-W
9	STAGHORN CREEK	6	0.0	9	0	59	5	Hd1	3	0	12	S-N
10	SUTTON MILLS CREEK	26	0.0	32	0	25	2	Hd1	2	1	100	W-E
11	TRANQUIL RIVER	13	7.7	0	0	70	0	Hb1	5	1	17	N-S
12	UNNAMED (N49 10.6 W125 41.8)	13	15.4	57	0	7	4	Hd1	2	4	4	N-S
13	UNNAMED (N49 10.8 W125 44.7)	5	0.0	32	0	2	2	Hd1	2	5	100	E-W
14	UNNAMED (N49 11.4 W125 37.5)	19	26.3	11	0	7	3	Hd1	2	1	100	E-W
15	UNNAMED (N49 11.5 W125 47.7)	21	4.8	10	0	6	0	Hd1	2	1	100	W-E
16	UNNAMED (N49 11.6 W125 37.4)	0		21	0	2	1	Hd1	2	3	2	E-W
17	UNNAMED (N49 11.6 W125 44.9)	0		19	0	2	5	Hd1	2	4	100	E-W
18	UNNAMED (N49 12.6 W125 45.0)	8	0.0	8	6	8	0	Hd1	2	3	100	E-W
19	UNNAMED (N49 13.3 W125 45.1)	1	0.0	10	0	2	1	Hd1	2	4	100	E-W
20	UNNAMED (N49 16.0 W125 43.5)	9	11.1	9	1	7	11	Hd1	2	4	8	E-W
21	UNNAMED (N49 4.4 W125 32.5)	12	25.0	5	0	20	0	Hd1	2	2	24	N-S
22	UNNAMED (N49 4.9 W125 33.6)	6	0.0	18	0	42	0	Hd1	2	2	24	N-S
23	WARN BAY CREEK	114	1.8	3	5	43	1	Hd1	3	1	4	E-W

Table 4. Catch by species for both stream order and gradient. All 23 streams were located in S.E. Clayoquot Sound.

		COHO n = 377	CUTTROAT n = 265	RAINBOW n = 37	ASPER n = 442	ALUTICUS n = 45
STREAM ORDER						
second	n = 12	120	232	7	130	29
third	n = 7	167	33	19	190	6
fourth	n = 4	90	90	11	122	10
STREAM GRADIENT						
0 - 1%	n = 12	288	86	16	326	19
2 - 3%	n = 6	61	52	20	96	3
4 - 5%	n = 5	28	127	1	20	23

Table 5. Cut history of selected watersheds in S.E. Clayoquot Sound and Barkley Sound (Brown et al. 1987a) relative to juvenile coho salmon age structure, catch, and mean length. Mean length of one year old coho salmon was calculated only for those watershed in which 8 or more one year old coho were trapped.

Watershed Cut History		Age Structure Coho-all	Coho-2yr	%2yr	Catch/Effort Coho/sq.m	Mean length Watersheds	Length(mm)
unlogged	n = 16	233	29	12.4%	0.034	n = 8	78.0
1 - 10 years	n = 10	250	11	4.4%	0.069 *	n = 6	84.0
11 - 35 years	n = 12	206	10	4.9%	0.033	n = 9	85.9
36+ years	n = 6	97	2	2.1%	0.037	n = 5	83.2
	n = 44	786	52			n = 28	

* When Warn Bay catch is excluded from this table, catch/effort for the cut history period of 1-10 years becomes 0.0376.

MAP INDEX

1 BEDWELL RIVER (2.0 km)
2 BEDWELL RIVER (4.5 km)
3 BEDWELL RIVER (PENNY CR.)
4 BEDWELL RIVER (WALLBASE)
5 KOOTOWIS CREEK
6 LOST SHOE CREEK
7 MURIEL CREEK
8 SALMON CREEK
9 STAGHORN CREEK
10 SUTTON MILLS CREEK
11 TRANQUIL RIVER
12 UNNAMED (N49 10.6 W125 41.8)
13 UNNAMED (N49 10.8 W125 44.7)
14 UNNAMED (N49 11.4 W125 37.5)
15 UNNAMED (N49 11.5 W125 47.7)
16 UNNAMED (N49 11.6 W125 37.4)
17 UNNAMED (N49 11.6 W125 44.9)
18 UNNAMED (N49 12.6 W125 45.0)
19 UNNAMED (N49 13.3 W125 45.1)
20 UNNAMED (N49 16.0 W125 43.5)
21 UNNAMED (N49 4.4 W125 32.5)
22 UNNAMED (N49 4.9 W125 33.6)
23 WARN BAY CREEK

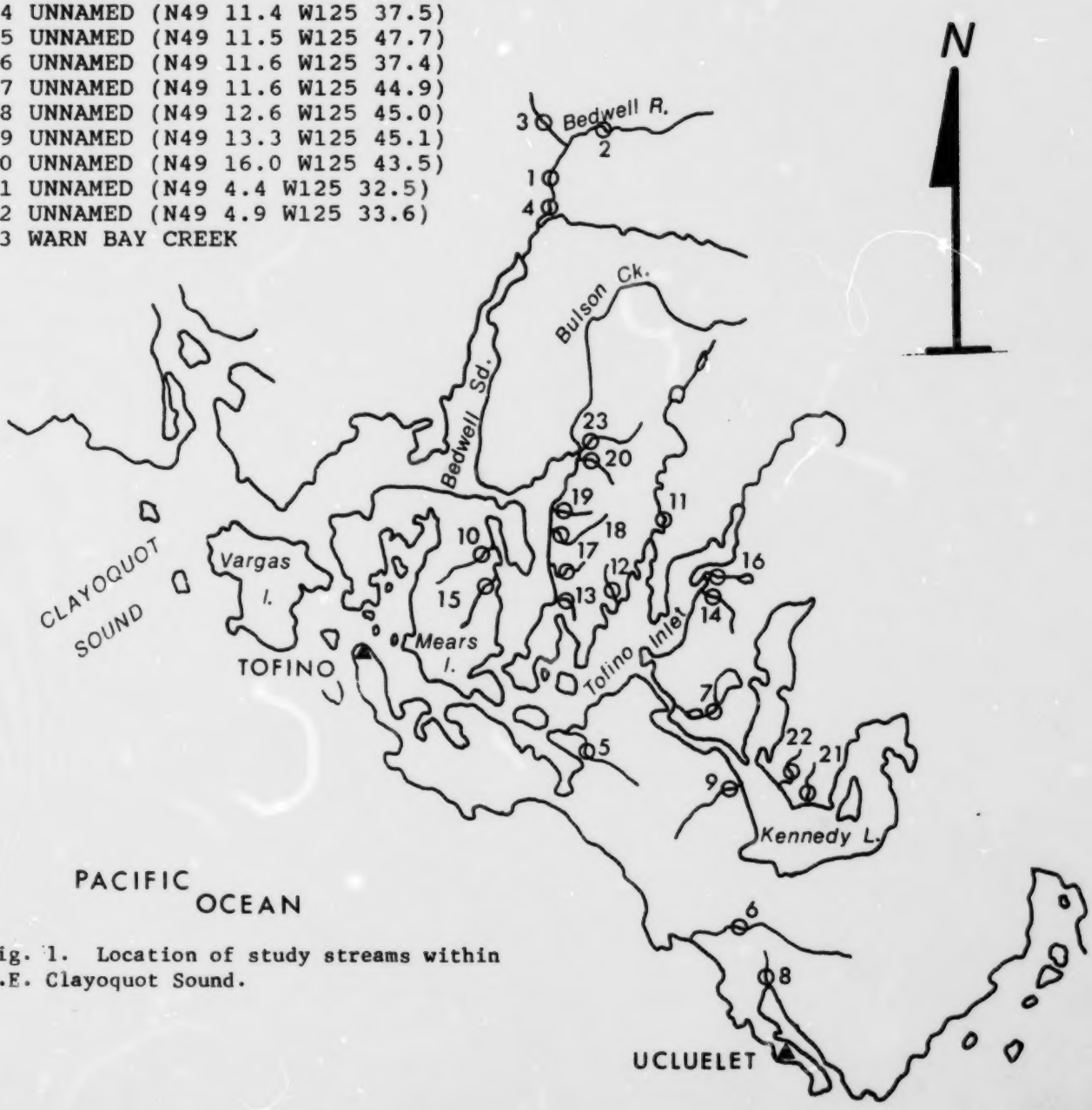


Fig. 1. Location of study streams within S.E. Clayoquot Sound.

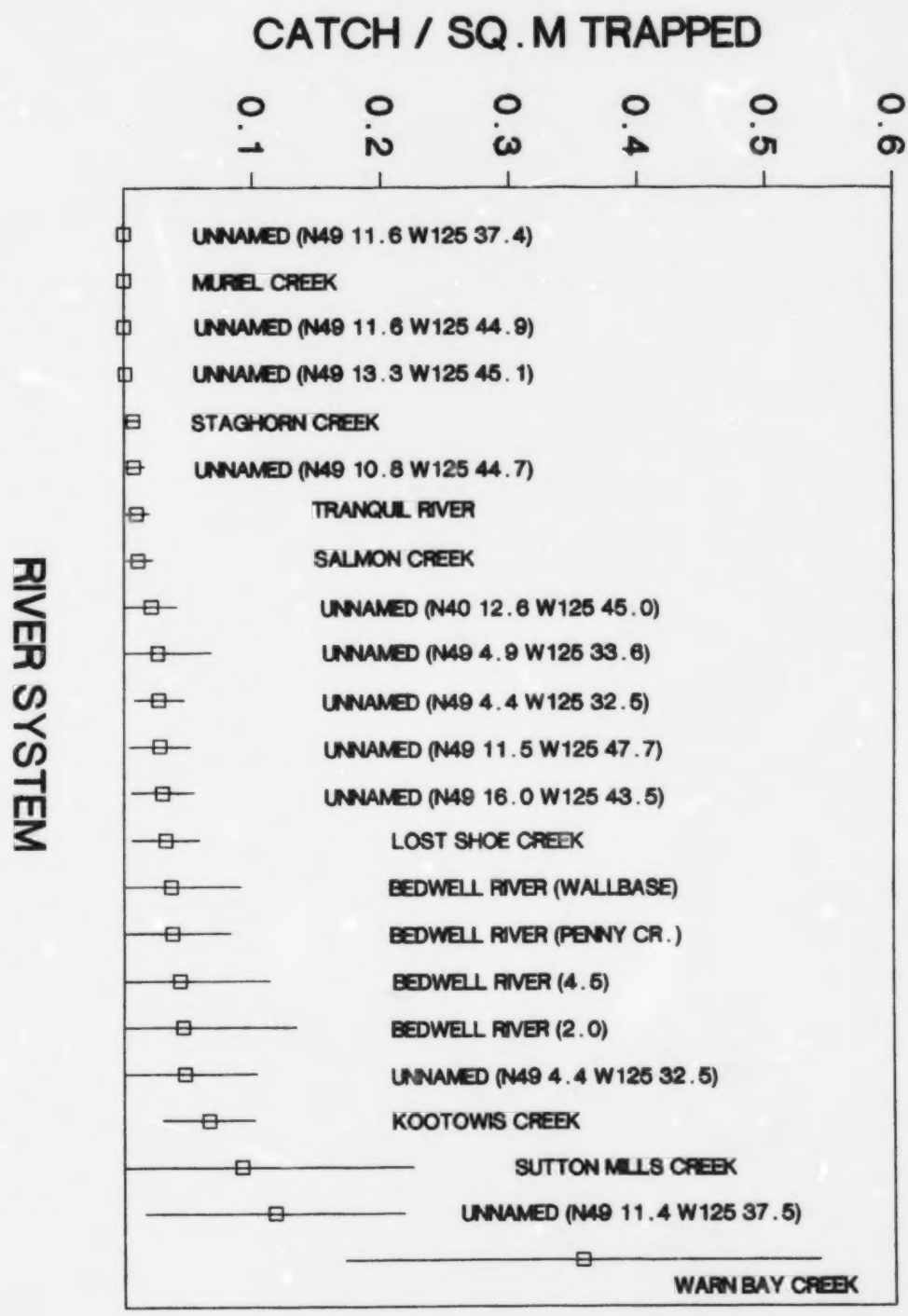


Fig. 2. Juvenile coho catch/effort by watershed. Vertical bars represent 95% C.L.

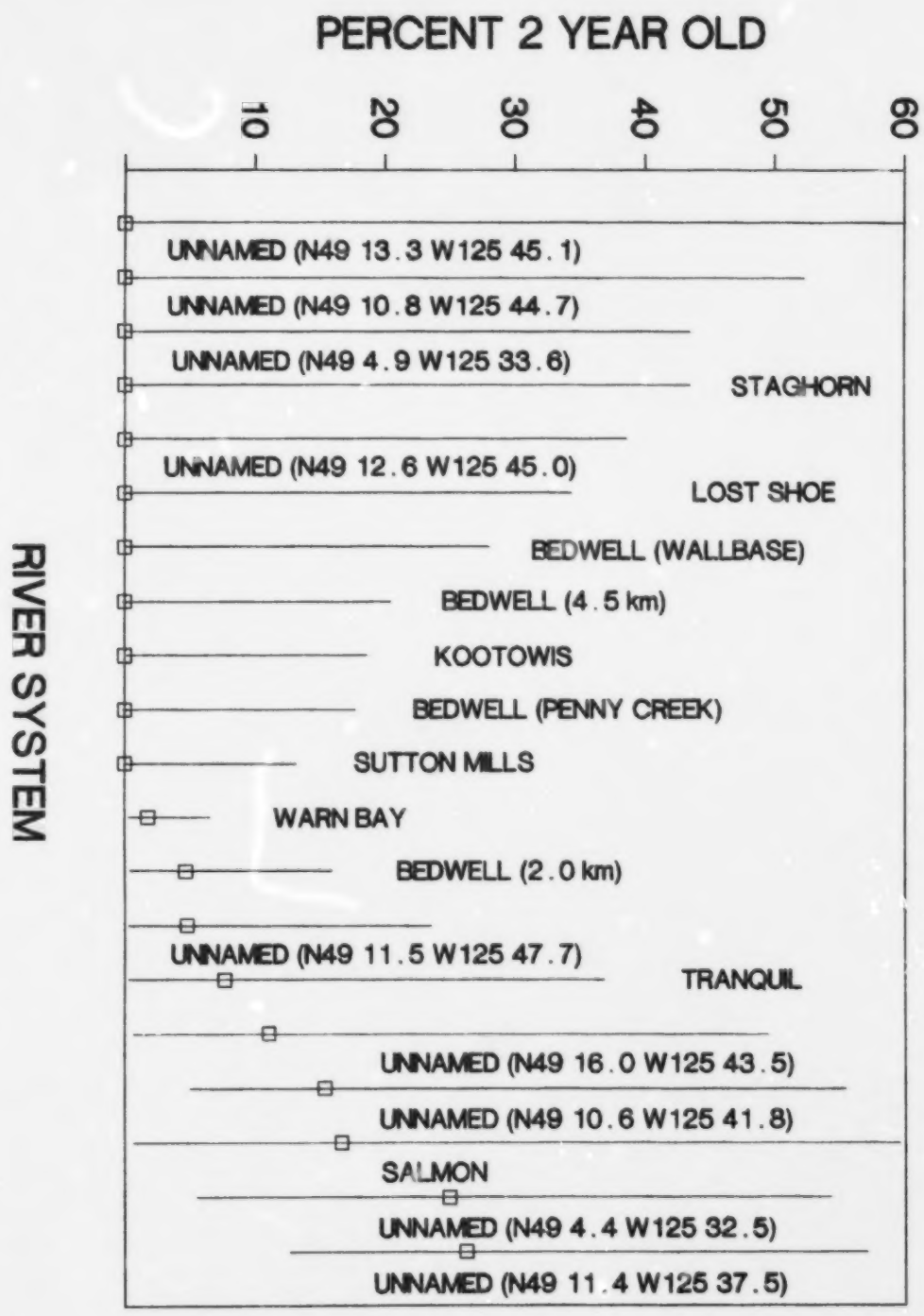


Fig. 3. Percentage 2-yr-old coho by watershed. Vertical bars represent 95% confidence limits (C.L.).

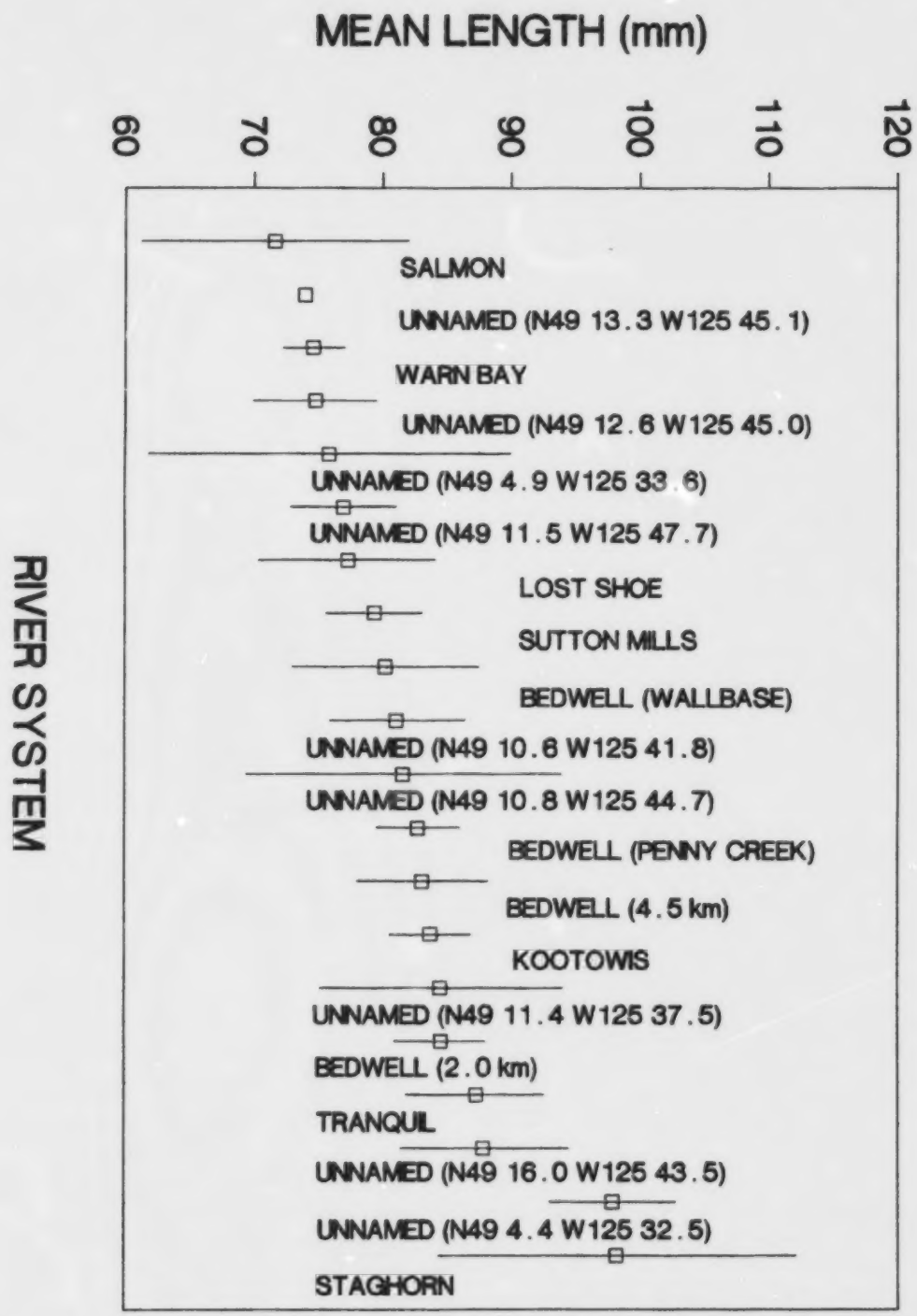


Fig. 4. Mean length of 1-yr-old coho (March 27-April 10). Vertical bars represent 95% C.L.

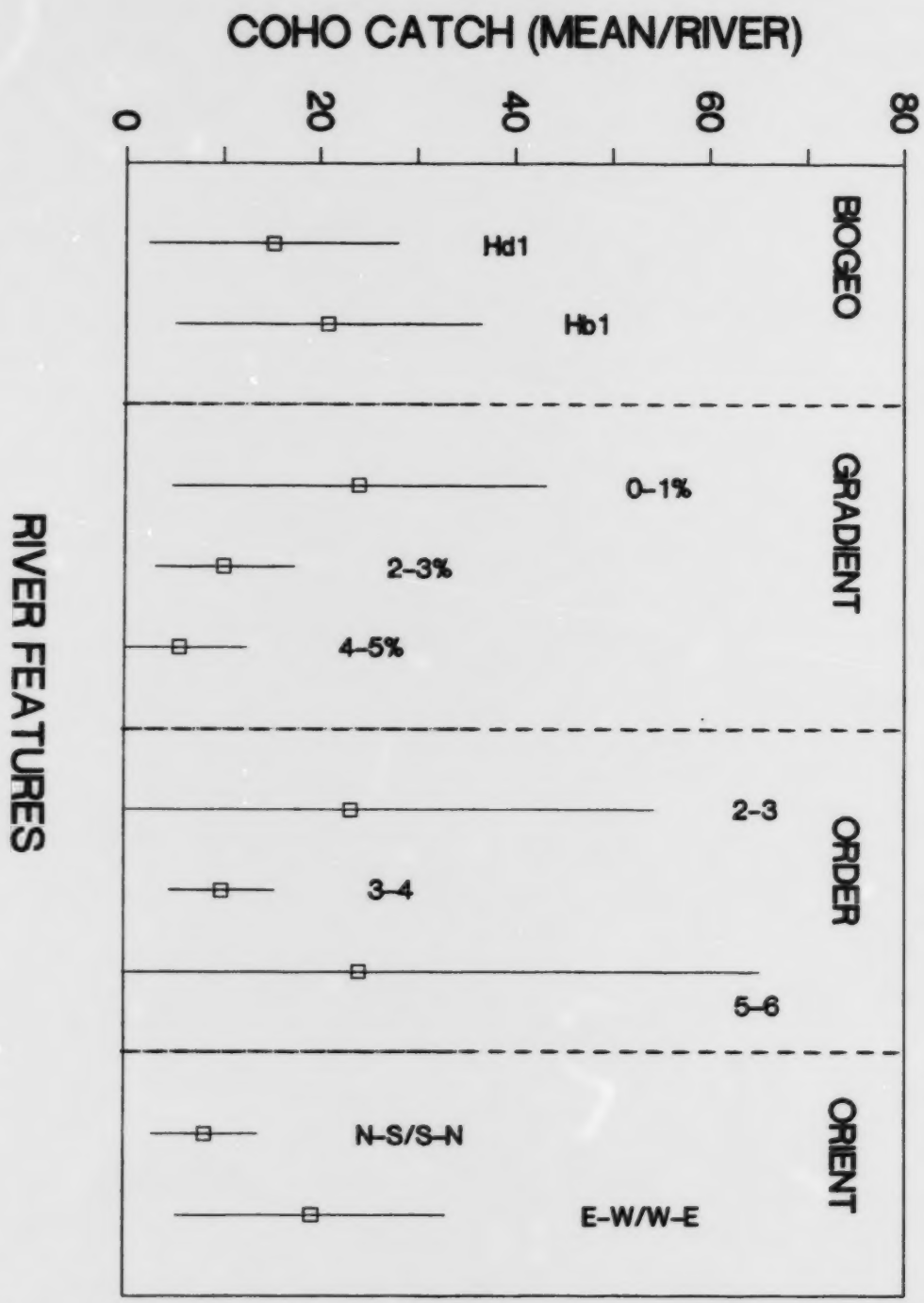


Fig. 5. Juvenile coho catch relative to watershed features; biogeoclimatic variant, stream gradient, stream order and watershed orientation. Vertical bars represent 95% C.L.

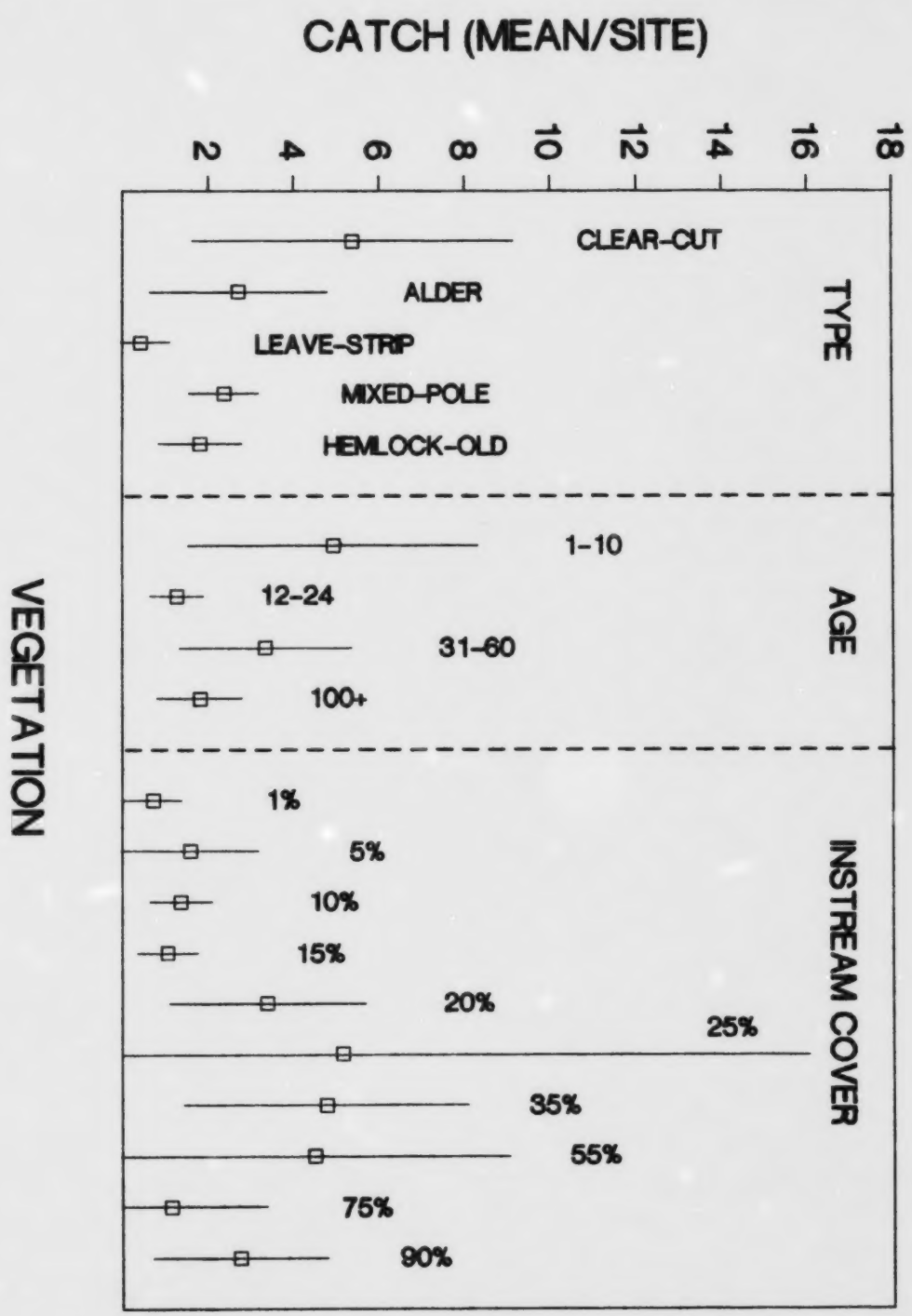


Fig. 6. Coho catch relative to riparian features; forest stand type bordering sample site; and percent cover provided by instream features. Vertical bars represent 95% C.L.

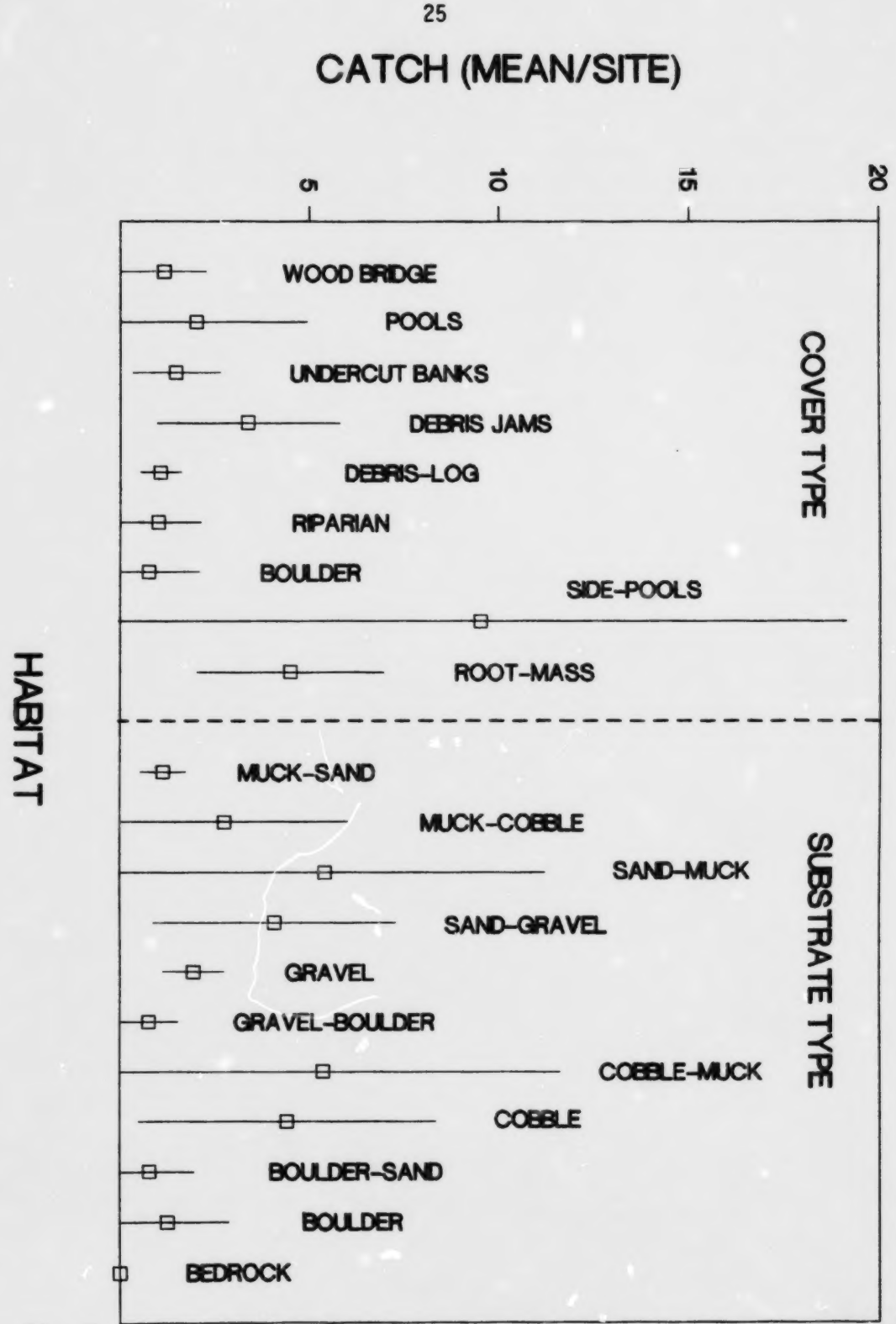


Fig. 7. Coho catch relative to in-stream features; type of in-stream cover and type of substrate within the channel. Vertical bars represent 95% C.L.

Appendix I Habitat characteristics for all sites.

NO	NAME	SITE	VEGETATION	VEG-AGE	SUBSTRATE	% COVER	HABITAT-TYPE
1	BEDWELL RIVER (2.0 km)	1	MIXED-POLE	35	GRAVEL	10	DEBRIS-LOG (SC)
		2	MIXED-POLE	35	GRAVEL	20	WOOD BRIDGE (SC)
		3	MIXED-POLE	35	MUD-SAND	20	SIDE-POOL (SC)
		4	ALDER	35	COBBLE-GRAVEL	35	DEBRIS-JAM (SC)
		5	ALDER	35	MUD-GRAVEL	10	RIPARIAN BRUSH (SC)
		6	ALDER	35	MUD	15	DEBRIS-LOG (SC)
2	BEDWELL RIVER (4.5 km)	1	ALDER	35	COBBLE-GRAVEL	10	RIPARIAN BUSH (SC)
		2	ALDER	35	COBBLE	20	ROOT-MASS (SC)
		3	ALDER	35	COBBLE	35	DEBRIS-JAM
		4	ALDER	35	BOULDER	2	UNDERCUT BANK
		5	ALDER	35	SAND-MUD	5	DEBRIS-LOG
		6	ALDER	35	SAND	10	DEBRIS-LOG
3	BEDWELL RIVER (PENNY CR.)	1	MIXED-POLE	36	SAND-COBBLE	6	POOL
		2	MIXED-POLE	36	COBBLE-SAND	10	UNDERCUT BANK
		3	MIXED-POLE	36	COBBLE-SAND	20	WOOD BRIDGE
		4	MIXED-POLE	36	GRAVEL-SAND	0	POOL
		5	ALDER	31	SAND-COBBLE	2	UNDERCUT BANK
		6	ALDER	31	COBBLE-SAND	5	UNDERCUT BANK
4	BEDWELL RIVER (WALLBASE)	1	MIXED-POLE	60	MUD	25	DEBRIS-JAM (SC)
		2	MIXED-POLE	60	MUD	30	DEBRIS-JAM (SC)
		3	MIXED-POLE	60	MUD-SAND	15	SIDE-POOL
		4	MIXED-POLE	60	MUD-SAND	15	SIDE-POOL
		5	MIXED-POLE	60	GRAVEL-SAND	15	DEBRIS-LOG
		6	MIXED-POLE	60	SAND-MUD	95	DEBRIS JAM
5	KOOTOWIS CREEK	1	MIXED-POLE	50	COBBLE-MUD	20	SIDE-POOL
		2	MIXED-POLE	50	COBBLE-MUD	20	DEBRIS-LOG
		3	MIXED-POLE	50	MUD	40	DEBRIS-LOG
		4	MIXED-POLE	50	MUD-COBBLE	20	UNDERCUT BANK (SC)
		5	MIXED-POLE	50	MUD	20	SIDE-POOL
		6	MIXED-POLE	50	BOULDER	20	BOULDER
6	LOST SHOE CREEK	1	MIXED-POLE	40	SAND-GRAVEL	40	DEBRIS-LOG
		2	MIXED-POLE	40	SAND-COBBLE	20	DEBRIS-LOG
		3	MIXED-POLE	40	COBBLE-SAND	20	DEBRIS-LOG
		4	CLEARCUT	10	GRAVEL-SAND	10	UNDERCUT BANK
		5	MIXED-POLE	40	GRAVEL-SAND	30	DEBRIS-JAM
		6	MIXED-POLE	40	SAND	10	ROOT-MASS
7	MURIEL CREEK	1	LEAVE-STRIP	15	SAND-MUD	95	DEBRIS-JAM
		2	LEAVE-STRIP	15	BOULDER-SAND	70	WOOD BRIDGE
		3	LEAVE-STRIP	15	MUD-SAND	80	DEBRIS-JAM
		4	LEAVE-STRIP	15	MUD-SAND	80	DEBRIS-JAM
		5	SALMONBERRY	20	MUD-SAND	95	DEBRIS-JAM
		6	SALMONBERRY	20	GRAVEL-SAND	80	RIPARIAN BRUSH
8	SALMON CREEK	1	LEAVE-STRIP	10	MUD	60	ROOT-MASS
		2	LEAVE-STRIP	10	MUD	30	DEBRIS-JAM
		3	CLEARCUT	5	MUD-SAND	60	DEBRIS-JAM
		4	CLEARCUT	5	GRAVEL-COBBLE	70	WOOD BRIDGE
		5	LEAVE-STRIP	5	MUD	10	RIPARIAN BRUSH
		6	CLEARCUT	5	MUD	10	RIPARIAN BRUSH

9	STAGHORN CREEK	1	ALDER	12	GRAVEL	20	DEBRIS-LOG
		2	ALDER	12	COBBLE-SAND	15	DEBRIS-LOG
		3	ALDER	12	MUD-GRAVEL	10	DEBRIS-LOG
		4	ALDER	12	MUD-GRAVEL	30	DEBRIS-LOG
		5	ALDER	12	GRAVEL	15	UNDERCUT BANK
		6	SALMONBERRY	12	GRAVEL	20	WOOD BRIDGE
10	SUTTON MILLS CREEK	1	HEMLOCK-OLD	100	COBBLE-GRAVEL	10	DEBRIS-JAM
		2	HEMLOCK-OLD	100	GRAVEL-SAND	75	DEBRIS-JAM
		3	HEMLOCK-OLD	100	SAND-MUD	90	ROOT-MASS
		4	HEMLOCK-OLD	100	SAND-GRAVEL	60	ROOT-MASS
		5	HEMLOCK-OLD	100	COBBLE-GRAVEL	20	ROOT-MASS
		6	HEMLOCK-OLD	100	BEDROCK	0	BOULDERS
11	TRANQUIL RIVER	1	ALDER	17	GRAVEL	15	DEBRIS-LOG
		2	ALDER	17	GRAVEL-COBBLE	30	ROOT-MASS
		3	ALDER	17	SAND-GRAVEL	85	DEBRIS-JAM
		4	ALDER	17	GRAVEL-SAND	5	DEBRIS-LOG
		5	ALDER	17	SAND	50	SIDE-POOL
12	UNNAMED (N49 10.6 W125 41.8)	1	CLEARCUT	4	COBBLE-MUD	75	ROOT-MASS
		2	CLEARCUT	4	GRAVEL-SAND	30	ROOT-MASS
		3	CLEARCUT	4	MUD-SAND	50	ROOT-MASS
		4	CLEARCUT	4	GRAVEL-SAND	50	DEBRIS-JAM
		5	CLEARCUT	4	GRAVEL-COBBLE	15	DEBRIS-LOG
		6	CLEARCUT	4	GRAVEL	30	ROOT-MASS
13	UNNAMED (N49 10.8 W125 44.7)	1	HEMLOCK-OLD	100	BOULDER	5	UNDERCUT BANK
		2	HEMLOCK-OLD	100	COBBLE	35	ROOT-MASS
		3	HEMLOCK-OLD	100	COBBLE-SAND	85	DEBRIS-JAM
		4	HEMLOCK-OLD	100	GRAVEL-SAND	5	DEBRIS-LOG
		5	HEMLOCK-OLD	100	SAND-GRAVEL	35	DEBRIS-JAM
		6	HEMLOCK-OLD	100	COBBLE-GRAVEL	40	ROOT-MASS
14	UNNAMED (N49 11.4 W125 37.5)	1	HEMLOCK-OLD	100	GRAVEL	50	ROOT-MASS
		2	HEMLOCK-OLD	100	GRAVEL-COBBLE	30	DEBRIS-JAM
		3	HEMLOCK-OLD	100	GRAVEL-COBBLE	40	ROOT-MASS
		4	HEMLOCK-OLD	100	GRAVEL-COBBLE	20	DEBRIS-LOG
		5	HEMLOCK-OLD	100	GRAVEL-SAND	20	DEBRIS-LOG
		6	HEMLOCK-OLD	100	COBBLE-GRAVEL	30	ROOT-MASS
15	UNNAMED (N49 11.5 W125 47.7)	1	HEMLOCK-OLD	100	BOULDER-SAND	15	DEBRIS-JAM
		2	HEMLOCK-OLD	100	BOULDER-GRAVEL	10	DEBRIS-LOG
		3	HEMLOCK-OLD	100	GRAVEL-SAND	2	POOL
		4	HEMLOCK-OLD	100	BOULDER-SAND	20	DEBRIS-LOG
		5	HEMLOCK-OLD	100	BOULDER-COBBLE	4	DEBRIS-LOG
		6	HEMLOCK-OLD	100	COBBLE-GRAVEL	20	ROOT-MASS
16	UNNAMED (N49 11.6 W125 37.4)	1	HEMLOCK-OLD	100	COBBLE	15	UNDERCUT BANK
		2	HEMLOCK-OLD	100	GRAVEL	5	DEBRIS-LOG
		3	CLEARCUT	1	COBBLE-GRAVEL	10	DEBRIS-LOG
		4	CLEARCUT	1	COBBLE-GRAVEL	15	DEBRIS-LOG
		5	CLEARCUT	1	COBBLE-GRAVEL	5	DEBRIS-LOG
		6	CLEARCUT	1	COBBLE	20	DEBRIS-LOG
17	UNNAMED (N49 11.6 W125 44.9)	1	HEMLOCK-OLD	100	BOULDER-GRAVEL	15	UNDERCUT BANK
		2	HEMLOCK-OLD	100	BOULDER-GRAVEL	5	POOL
		3	HEMLOCK-OLD	100	GRAVEL-BOULDER	5	DEBRIS-LOG
		4	HEMLOCK-OLD	100	GRAVEL-BOULDER	10	UNDERCUT BANK
		5	HEMLOCK-OLD	100	GRAVEL-BOULDER	10	DEBRIS-LOG
		6	HEMLOCK-OLD	100	GRAVEL-BOULDER	10	DEBRIS-LOG

18 UNNAMED (N49 12.6 W125 45.0)	1	HEMLOCK-OLD	100	BOULDER-GRAVEL	15 DEBRIS-JAM
	2	HEMLOCK-OLD	100	GRAVEL-BOULDER	20 ROOT-MASS
	3	HEMLOCK-OLD	100	GRAVEL-SAND	20 ROOT-MASS
	4	HEMLOCK-OLD	100	SAND-COBBLE	20 ROOT-MASS
	5	HEMLOCK-OLD	100	BOULDER-GRAVEL	30 DEBRIS-JAM
	6	HEMLOCK-OLD	100	BOULDER-GRAVEL	40 ROOT-MASS
19 UNNAMED (N49 13.3 W125 45.1)	1	HEMLOCK-OLD	100	BOULDER	5 BOULDER
	2	HEMLOCK-OLD	100	BOULDER	15 BOULDER
	3	HEMLOCK-OLD	100	COBBLE-SAND	25 DEBRIS-LOG
	4	HEMLOCK-OLD	100	COBBLE	60 DEBRIS-JAM
	5	HEMLOCK-OLD	100	GRAVEL-COBBLE	30 DEBRIS-LOG
	6	HEMLOCK-OLD	100	BOULDER	2 POOL
20 UNNAMED (N49 16.0 W125 43.5)	1	CLEARCUT	8	COBBLE-GRAVEL	20 DEBRIS-JAM
	2	CLEARCUT	8	COBBLE-GRAVEL	10 UNDERCUT BANK
	3	CLEARCUT	8	COBBLE-GRAVEL	15 DEBRIS-JAM
	4	CLEARCUT	8	COBBLE-GRAVEL	10 ROOT-MASS
	5	CLEARCUT	8	COBBLE-GRAVEL	15 ROOT-MASS
	6	CLEARCUT	8	BOULDER	40 WOOD BRIDGE
21 UNNAMED (N49 4.4 W125 32.5)	1	ALDER	22	GRAVEL	25 DEBRIS-JAM
	2	ALDER	22	GRAVEL	35 DEBRIS-JAM
	3	ALDER	24	GRAVEL-SAND	15 DEBRIS-LOG
	4	ALDER	24	SAND-GRAVEL	85 DEBRIS-JAM
	5	ALDER	24	SAND-GRAVEL	10 RIPARIAN BRUSH
	6	ALDER	24	GRAVEL-SAND	2 POOL
22 UNNAMED (N49 4.9 W125 33.6)	1	ALDER	24	SAND-GRAVEL	25 DEBRIS-LOG
	2	ALDER	24	GRAVEL-SAND	15 UNDERCUT BANK
	3	ALDER	24	GRAVEL-SAND	25 ROOT-MASS
	4	ALDER	24	SAND-GRAVEL	100 WOOD BRIDGE
	5	MIXED-POLE	24	SAND	25 RIPARIAN BRUSH
	6	MIXED-POLE	24	SAND	15 DEBRIS-LOG
23 WARM BAY CREEK	1	CLEARCUT	4	GRAVEL	30 DEBRIS-JAM
	2	CLEARCUT	4	SAND-MUD	20 SIDE-POOL
	3	CLEARCUT	4	GRAVEL	40 DEBRIS-LOG
	4	CLEARCUT	4	COBBLE-GRAVEL	30 ROOT-MASS
	5	CLEARCUT	4	SAND-GRAVEL	40 DEBRIS-JAM
	6	CLEARCUT	4	COBBLE-SAND	25 SIDE-POOL

Appendix II Fish catch for all sites.

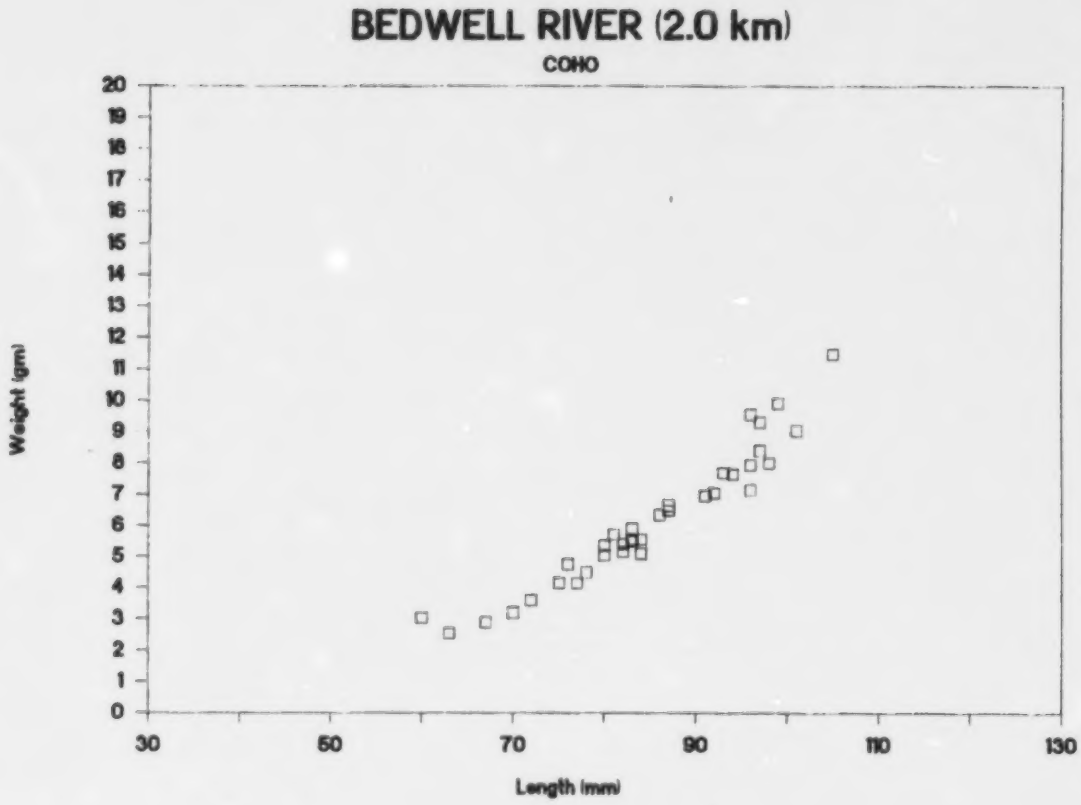
NO	NAME	SITE	DATE	AREA SQ.M	VOLUME CU.M	CATCH COHO	CUT	RBT	ALUT	ASPR	MISC	COMMENT
1	BEDWELL RIVER (2.0 km)	1	07-Apr	160	80	4	0	0	0	5	0	
		2	07-Apr	120	60	1	0	0	1	7	0	
		3	07-Apr	100	150	0	0	1	0	3	0	
		4	07-Apr	150	60	35	0	1	0	1	0	
		5	07-Apr	360	180	3	0	0	0	0	0	
		6	07-Apr	198	99	0	0	0	0	0	0	
2	BEDWELL RIVER (4.5 km)	1	07-Apr	133	40	0	0	1	0	0	0	
		2	07-Apr	42	29	8	0	3	0	2	0	
		3	07-Apr	210	105	5	0	2	1	4	0	
		4	07-Apr	112	67	0	0	0	0	0	0	
		5	07-Apr	56	112	2	0	2	0	6	0	
		6	07-Apr	104	156	1	0	0	1	7	0	
3	BEDWELL RIVER (PENNY CR.)	1	07-Apr	60	30	8	0	2	0	0	0	
		2	07-Apr	264	132	4	0	0	0	1	0	
		3	07-Apr	152	122	4	0	0	0	0	0	
		4	07-Apr	83	17	1	0	3	0	1	0	
		5	07-Apr	60	24	1	0	0	0	1	0	
		6	07-Apr	50	25	1	0	1	0	2	0	
4	BEDWELL RIVER (WALLBASE)	1	07-Apr	72	7	1	0	0	0	0	0	
		2	07-Apr	20	5	3	0	0	0	5	0	
		3	07-Apr	225	90	0	0	0	0	10	0	
		4	07-Apr	225	90	1	0	0	0	25	1	STICKLEBACK
		5	07-Apr	200	30	2	0	0	0	7	6	STICKLEBACK
		6	07-Apr	144	58	6	0	0	0	8	1	STICKLEBACK
5	KOOTOWIS CREEK	1	30-Mar	30	15	4	0	0	2	3	0	
		2	30-Mar	27	16	1	0	0	1	4	0	
		3	30-Mar	68	41	2	0	0	1	2	2	COHO FRY
		4	30-Mar	81	41	6	0	0	2	2	0	
		5	30-Mar	50	30	3	0	1	1	2	1	STICKLEBACK
		6	30-Mar	32	16	2	0	0	0	4	0	
6	LOST SHOE CREEK	1	29-Mar	60	60	1	0	4	0	0	0	
		2	29-Mar	24	29	2	0	2	0	0	1	COHO FRY
		3	29-Mar	25	25	1	0	0	0	0	0	
		4	29-Mar	70	70	1	0	1	0	0	0	
		5	29-Mar	110	110	1	0	0	0	0	0	
		6	29-Mar	96	96	3	0	1	0	0	0	
7	MURIEL CREEK	1	10-Apr	216	432	0	1	0	0	4	0	
		2	10-Apr	192	288	0	0	0	0	7	0	
		3	10-Apr	100	200	0	1	0	0	4	0	
		4	10-Apr	160	400	0	1	0	0	1	0	
		5	10-Apr	80	120	0	1	0	0	3	1	CHUB
		6	10-Apr	44	44	0	1	0	0	9	2	CHUB, CRAYFISH
8	SALMON CREEK	1	29-Mar	25	13	0	5	0	0	0	3	DOLLY VARDEN, STICKLEBACK
		2	29-Mar	60	30	1	3	0	0	0	2	DOLLY VARDEN
		3	29-Mar	84	38	1	3	0	0	0	3	STICKLEBACK, CRAWFISH, COHO FRY
		4	29-Mar	200	80	0	2	0	0	0	1	STICKLEBACK
		5	29-Mar	96	58	2	2	0	0	0	1	STICKLEBACK
		6	29-Mar	121	61	2	0	0	0	0	4	STICKLEBACK

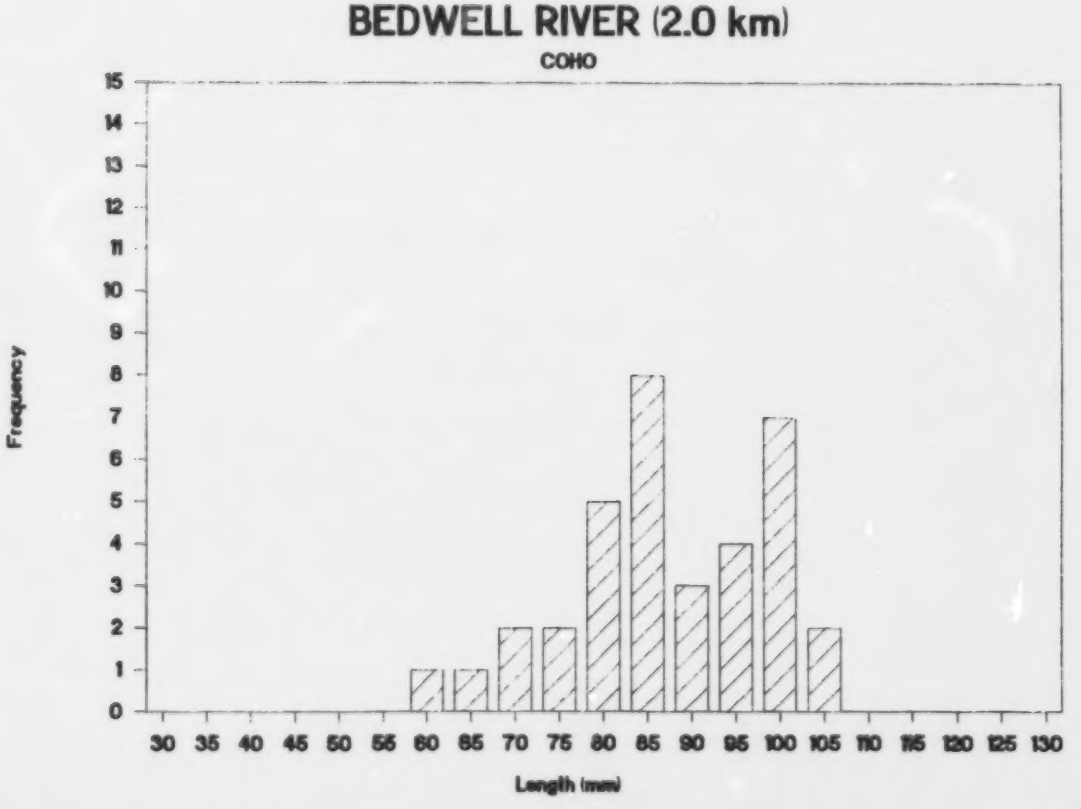
9 STAGBORN CREEK	1	09-Apr	400	280	1	2	0	0	2	0 STICKLEBACK
	2	09-Apr	144	158	0	0	0	0	20	0 STICKLEBACK
	3	09-Apr	160	80	1	0	0	1	17	3
	4	09-Apr	135	203	1	0	0	1	9	1 STICKLEBACK
	5	09-Apr	120	36	2	6	0	1	7	0
	6	09-Apr	100	60	1	1	0	2	4	1
10 SUTTON MILLS CREEK	1	03-Apr	81	41	1	1	0	0	4	0
	2	03-Apr	35	7	1	7	0	2	7	0
	3	03-Apr	50	10	7	5	0	0	7	0
	4	03-Apr	45	18	16	14	0	0	2	0
	5	03-Apr	72	43	1	3	0	0	5	0
	6	03-Apr	70	49	0	2	0	0	0	0
11 TRANQUIL RIVER	1	31-Mar	334	334	0	0	0	0	8	0
	2	31-Mar	270	108	2	0	0	0	3	0
	3	31-Mar	192	288	3	0	0	0	18	0
	4	31-Mar	238	357	1	0	0	0	9	0
	5	31-Mar	328	820	7	0	0	0	32	0
12 UNNAMED (N49 10.6 W125 41.8)	1	31-Mar	50	25	7	3	0	0	2	0
	2	31-Mar	50	30	3	8	0	1	5	0
	3	31-Mar	36	18	3	8	0	1	0	0
	4	31-Mar	45	23	0	10	0	1	0	0
	5	31-Mar	40	24	0	15	0	1	0	0
	6	31-Mar	30	12	0	13	0	0	0	0
13 UNNAMED (N49 10.8 W125 44.7)	1	06-Apr	48	24	0	4	0	0	1	0
	2	06-Apr	105	32	0	2	0	0	0	0
	3	06-Apr	153	107	3	8	0	1	1	1 CRAYFISH
	4	06-Apr	88	44	0	2	0	0	0	0
	5	06-Apr	62	37	1	11	0	0	0	0
	6	06-Apr	120	36	1	5	0	1	0	4 CRAYFISH
14 UNNAMED (N49 11.4 W125 37.5)	1	31-Mar	30	18	9	1	0	1	1	0
	2	31-Mar	24	17	4	1	0	0	0	0
	3	31-Mar	16	8	2	7	0	0	4	0
	4	31-Mar	60	18	1	1	0	0	2	0
	5	31-Mar	20	6	1	0	0	0	0	0
	6	31-Mar	43	13	2	1	0	2	0	0
15 UNNAMED (N49 11.5 W125 47.7)	1	06-Apr	120	48	5	1	0	0	0	0
	2	06-Apr	100	60	0	1	0	0	4	0
	3	06-Apr	40	60	1	2	0	0	2	3 CRAYFISH
	4	06-Apr	120	84	0	2	0	0	0	0
	5	06-Apr	160	64	6	1	0	0	0	1 CRAYFISH
	6	06-Apr	144	72	9	3	0	0	0	3 CRAYFISH
16 UNNAMED (N49 11.6 W125 37.4)	1	31-Mar	30	6	0	2	0	0	0	0
	2	31-Mar	38	8	0	3	0	0	1	0
	3	31-Mar	70	14	0	6	0	0	0	0
	4	31-Mar	20	4	0	3	0	1	1	0
	5	31-Mar	27	5	0	2	0	0	0	0
	6	31-Mar	82	25	0	5	0	0	0	0
17 UNNAMED (N49 11.6 W125 44.9)	1	06-Apr	42	13	0	10	0	0	2	0
	2	06-Apr	25	10	0	5	0	0	0	0
	3	06-Apr	75	15	0	0	0	2	0	0
	4	06-Apr	30	9	0	0	0	1	0	0
	5	06-Apr	36	11	0	2	0	0	0	0
	6	06-Apr	70	35	0	2	0	2	0	0

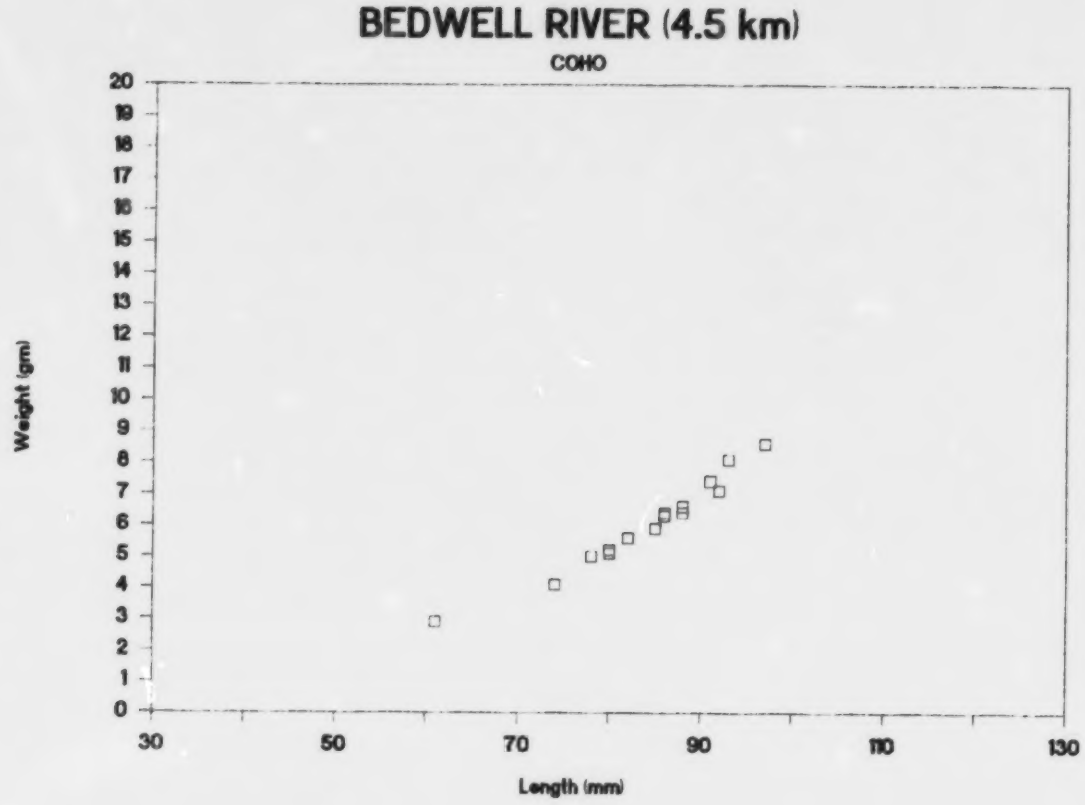
18 UNNAMED (N49 12.6 W125 45.0)	1	06-Apr	14	6	0	0	0	0	1	0	
	2	06-Apr	70	28	0	1	0	0	0	0	
	3	06-Apr	75	23	3	1	1	0	0	0	
	4	06-Apr	65	20	3	1	4	0	2	0	
	5	06-Apr	198	79	1	4	1	0	1	0	
	6	06-Apr	28	11	1	1	0	0	4	0	
19 UNNAMED (N49 13.3 W125 45.1)	1	04-Apr	150	30	1	1	0	0	2	0	
	2	04-Apr	75	23	0	1	0	0	0	0	
	3	04-Apr	49	49	0	3	0	1	0	0	
	4	04-Apr	40	20	0	2	0	0	0	0	
	5	04-Apr	60	48	0	0	0	0	0	0	
	6	04-Apr	75	38	0	3	0	0	0	0	
20 UNNAMED (N49 16.0 W125 43.5)	1	03-Apr	40	24	2	2	0	0	7	0	
	2	03-Apr	48	14	0	1	0	0	0	0	
	3	03-Apr	28	14	1	1	0	1	0	0	
	4	03-Apr	60	18	4	1	1	4	0	0	
	5	03-Apr	68	14	1	2	0	3	0	0	
	6	03-Apr	78	16	1	2	0	3	0	0	
21 UNNAMED (N49 4.4 W125 32.5)	1	09-Apr	90	36	1	0	0	0	0	1	LAMPREY
	2	09-Apr	75	45	4	0	0	0	11	0	
	3	09-Apr	88	35	3	3	0	0	1	0	
	4	09-Apr	48	24	2	0	0	0	4	0	
	5	09-Apr	42	17	0	2	0	0	3	0	
	6	09-Apr	90	72	2	0	0	0	1	0	
22 UNNAMED (N49 4.9 W125 33.6)	1	09-Apr	60	30	0	3	0	0	3	0	
	2	09-Apr	36	14	4	4	0	0	8	1	COHO FRY
	3	09-Apr	52	21	0	4	0	0	1	0	
	4	09-Apr	30	24	1	0	0	0	21	0	
	5	09-Apr	104	42	0	3	0	0	2	0	
	6	09-Apr	70	28	1	4	0	0	7	0	
23 WARN BAY CREEK	1	03-Apr	30	15	4	0	0	1	2	0	
	2	03-Apr	64	19	27	0	2	0	9	0	
	3	03-Apr	48	48	7	2	1	0	7	0	
	4	03-Apr	42	42	27	0	1	0	17	0	
	5	03-Apr	42	17	15	0	1	0	8	1	COHO FRY
	6	03-Apr	77	23	34	1	0	0	0	5	NEWT

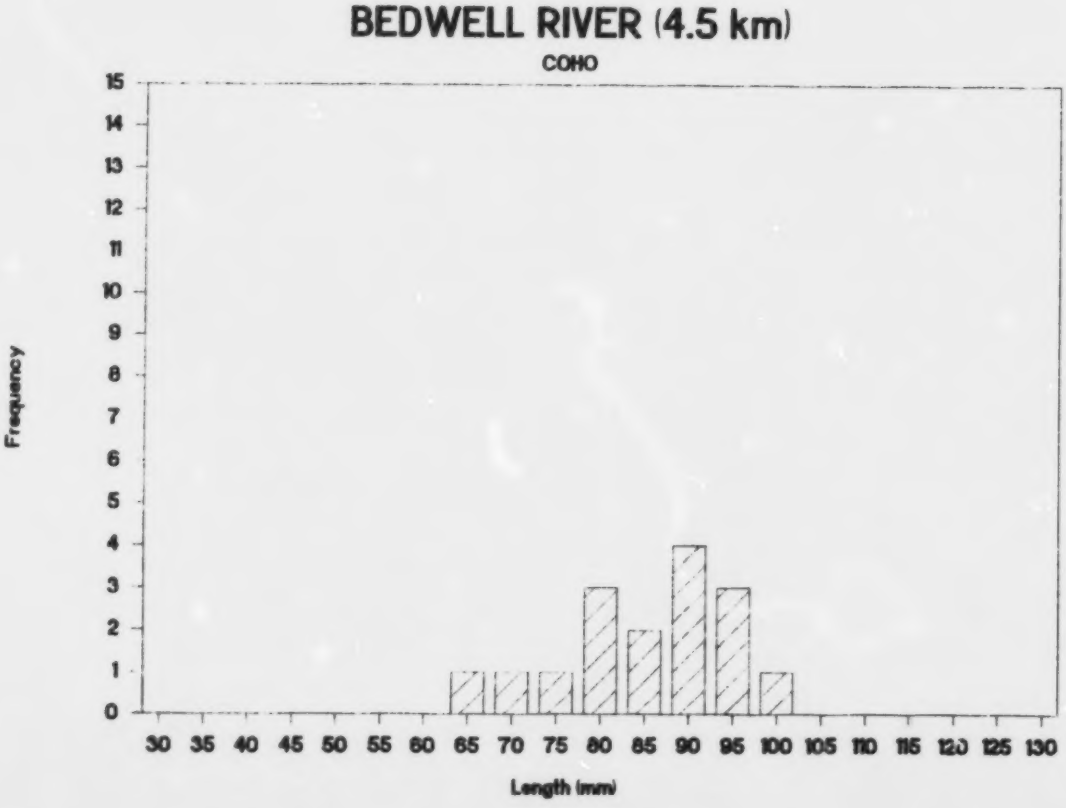
Appendix III Coho salmon, cutthroat trout, and rainbow trout length frequency distributions and length/weight relationships for watersheds in which more than 4 fish of a given species were captured (indicated by Y).

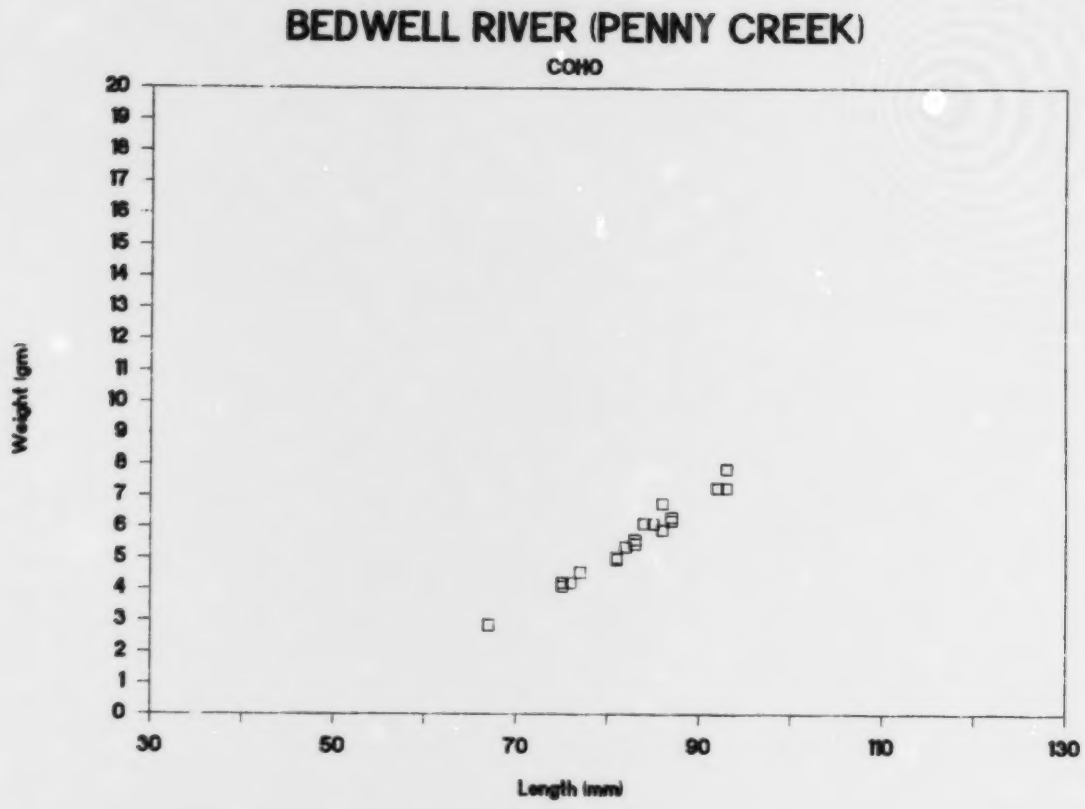
NO.	RIVER	COHO	CUTTROAT	RAINBOW
1	BEDWELL RIVER (2.0 km)	Y		
2	BEDWELL RIVER (4.5 km)	Y		Y
3	BEDWELL RIVER (PENNY CR.)	Y		Y
4	BEDWELL RIVER (WALLBASE)	Y		
5	KOOTOWIS CREEK	Y		
6	LOST SHOE CREEK	Y		Y
7	MURIEL CREEK		Y	
8	SALMON CREEK	Y	Y	
9	STAGHORN CREEK	Y	Y	
10	SUTTON MILLS CREEK	Y	Y	
11	TRANQUIL RIVER	Y		
12	UNNAMED (N49 10.6 W125 41.8)	Y	Y	
13	UNNAMED (N49 10.8 W125 44.7)	Y	Y	
14	UNNAMED (N49 11.4 W125 37.5)	Y	Y	
15	UNNAMED (N49 11.5 W125 47.7)	Y	Y	
16	UNNAMED (N49 11.6 W125 37.4)		Y	
17	UNNAMED (N49 11.6 W125 44.9)		Y	
18	UNNAMED (N49 12.6 W125 45.0)	Y	Y	Y
19	UNNAMED (N49 13.3 W125 45.1)		Y	
20	UNNAMED (N49 16.0 W125 43.5)	Y	Y	
21	UNNAMED (N49 4.4 W125 32.5)	Y	Y	
22	UNNAMED (N49 4.9 W125 33.6)	Y	Y	
23	WARN BAY CREEK	Y		Y

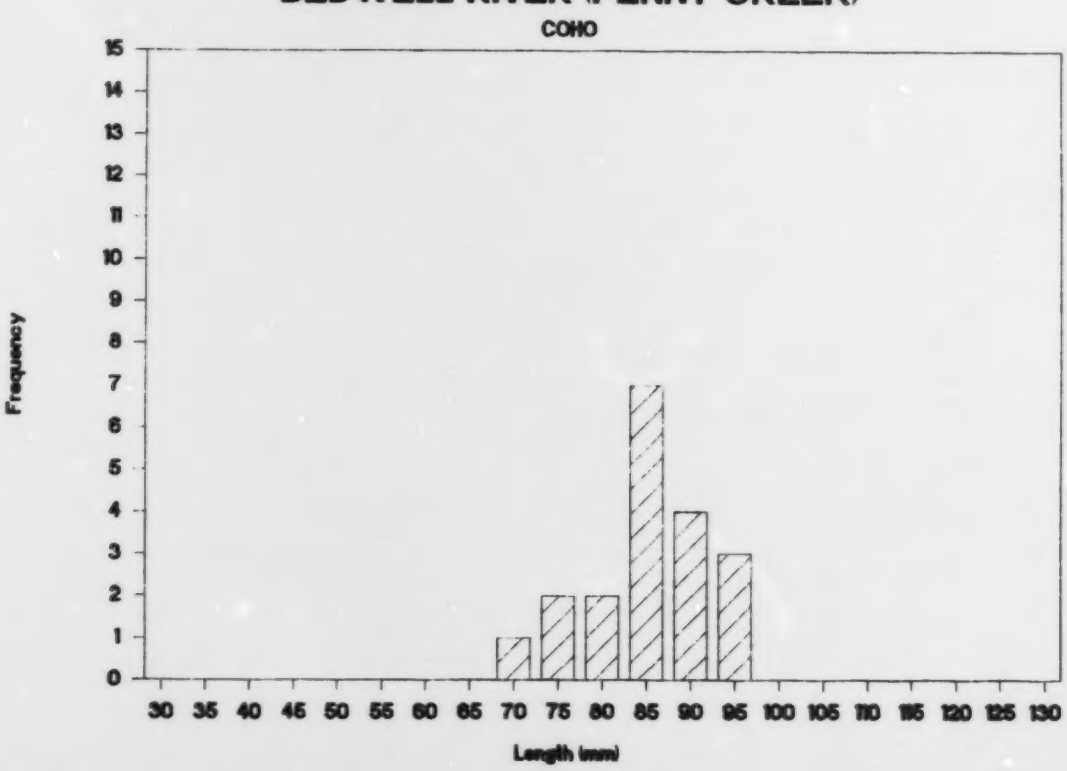

BEDWELL RIVER (2.0 km)
COHO
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)


BEDWELL RIVER (2.0 km)
COHO
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)


BEDWELL RIVER (4.5 km)
COHO
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)

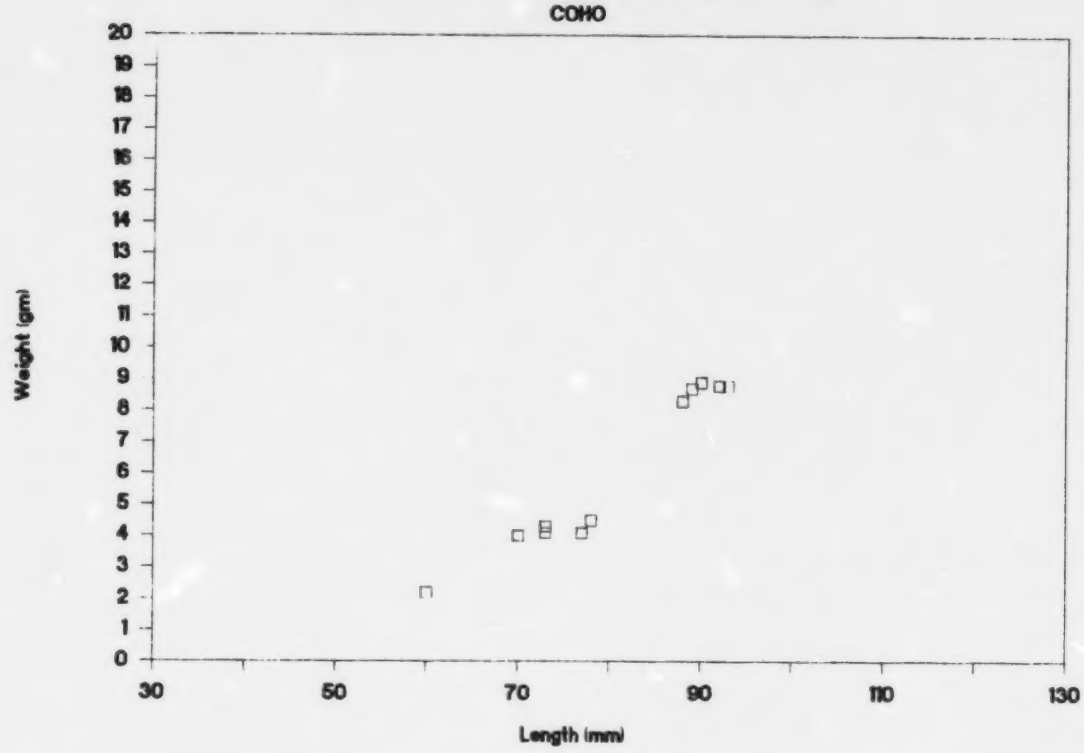

BEDWELL RIVER (4.5 km)
COHO
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)


BEDWELL RIVER (PENNY CREEK)
COHO
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)


BEDWELL RIVER (PENNY CREEK)
COHO
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)

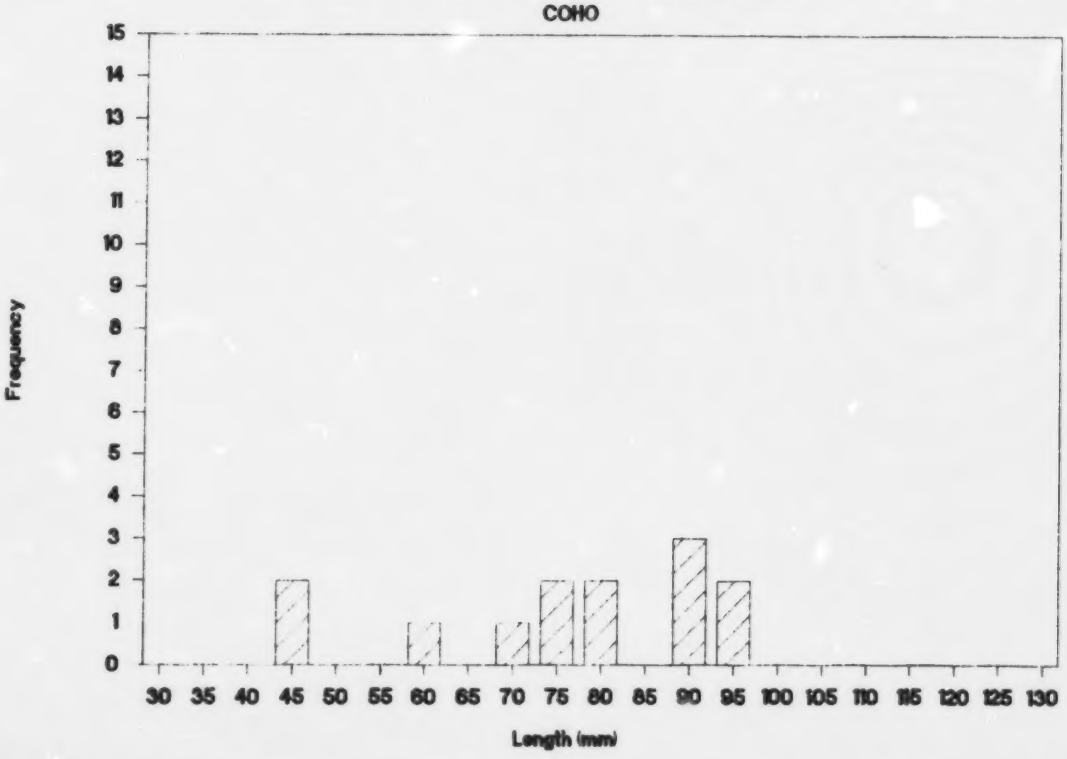
BEDWELL RIVER (WALLBASE)

COHO



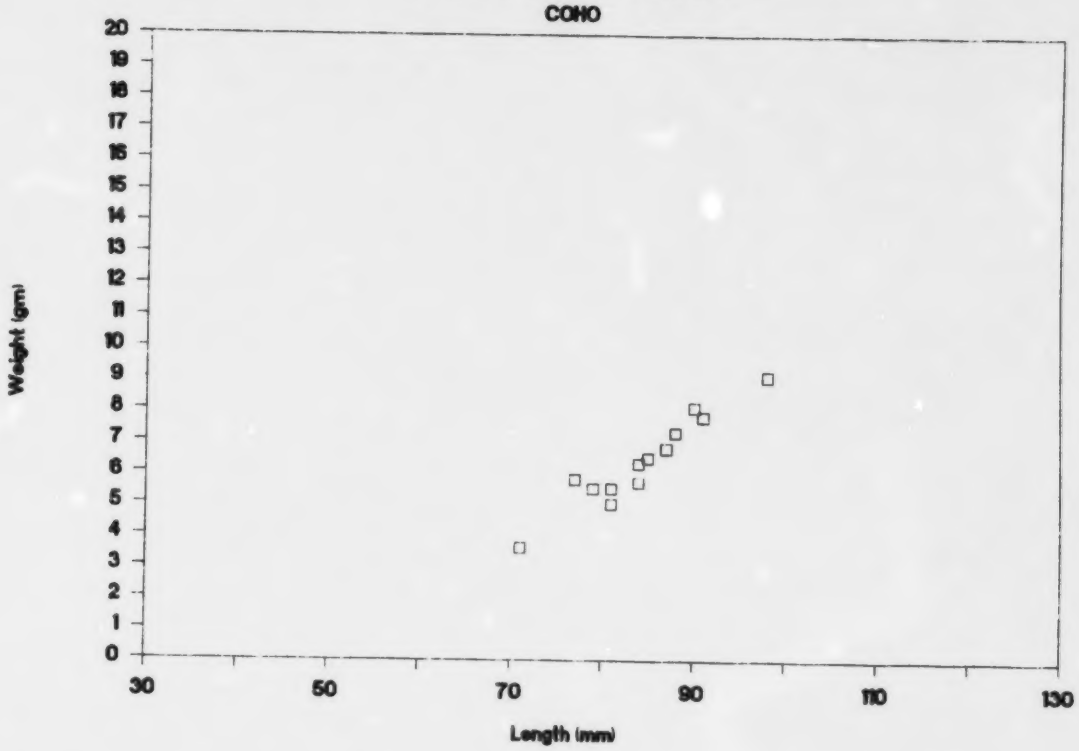
BEDWELL RIVER (WALLBASE)

COHO



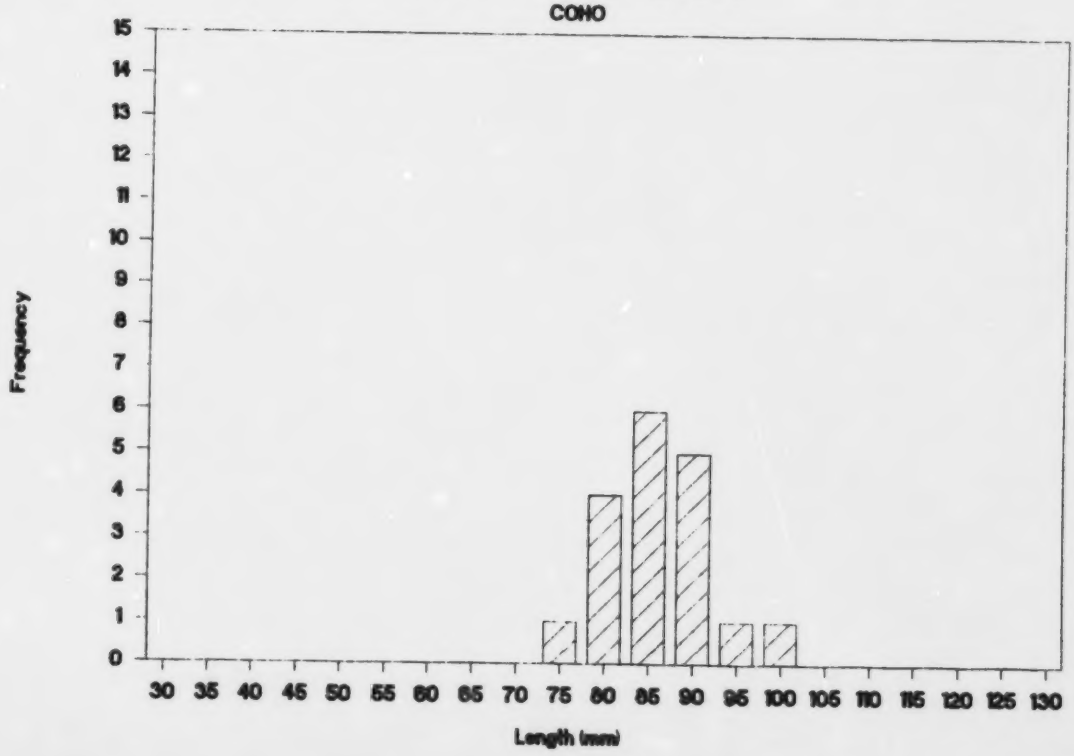
KOOTOWIS RIVER

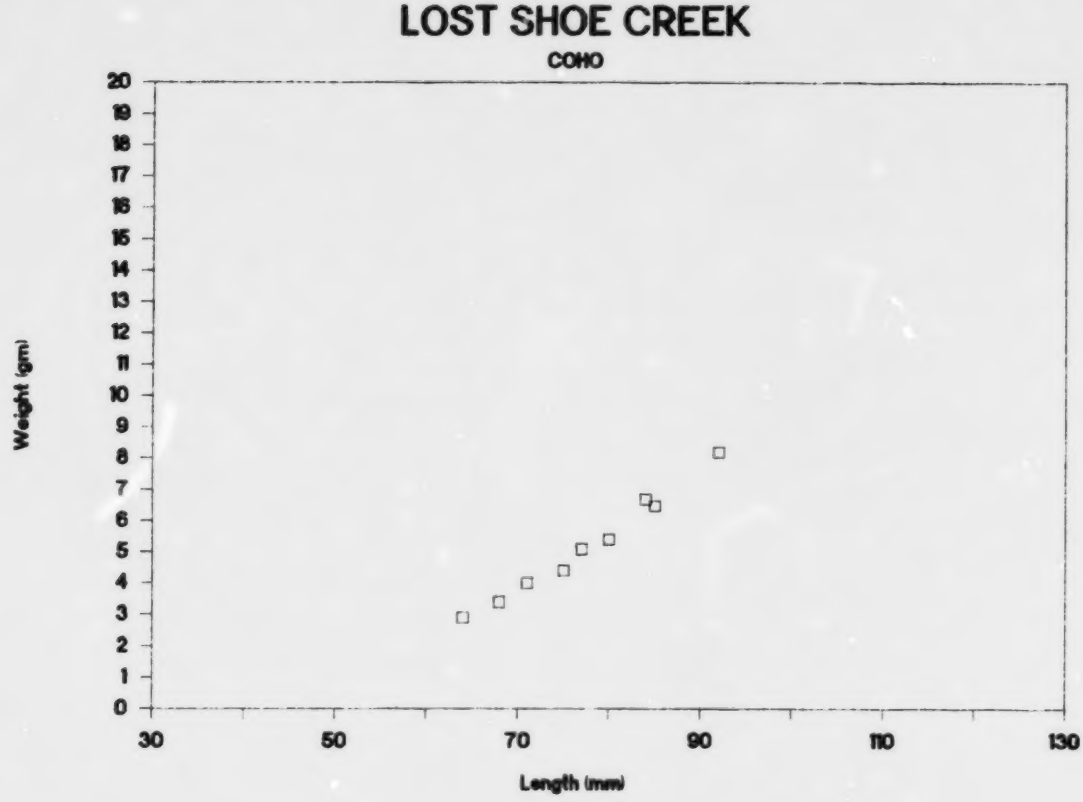
COHO

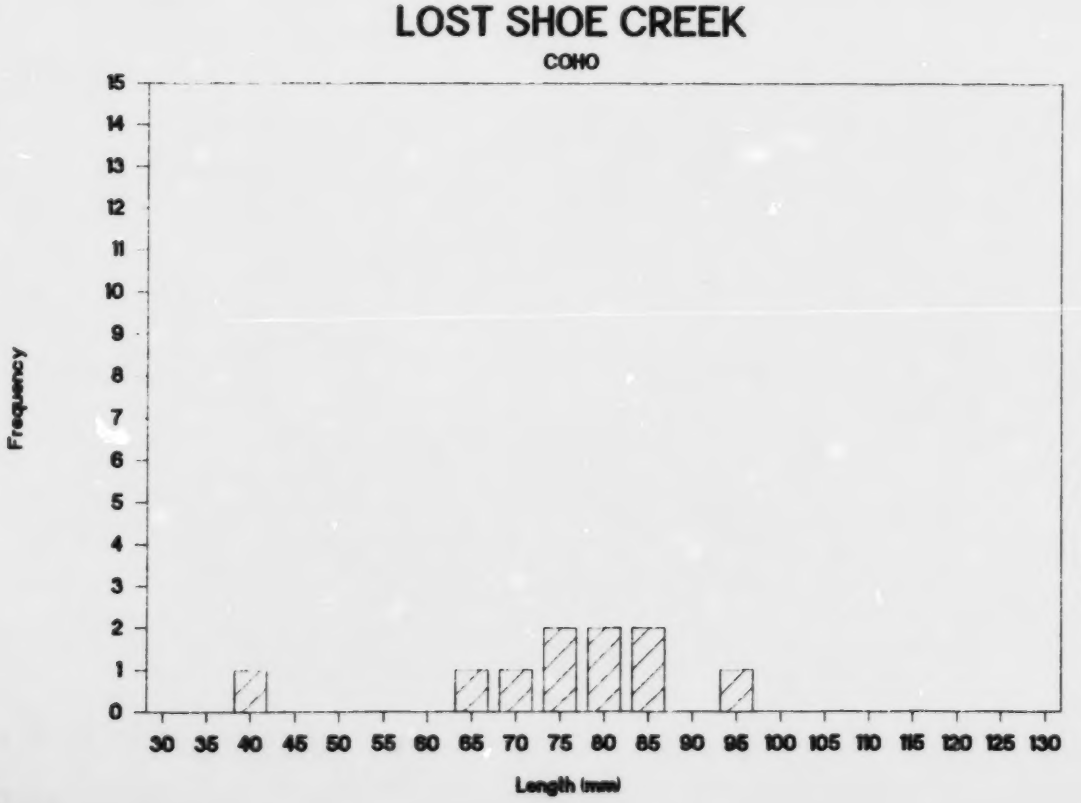


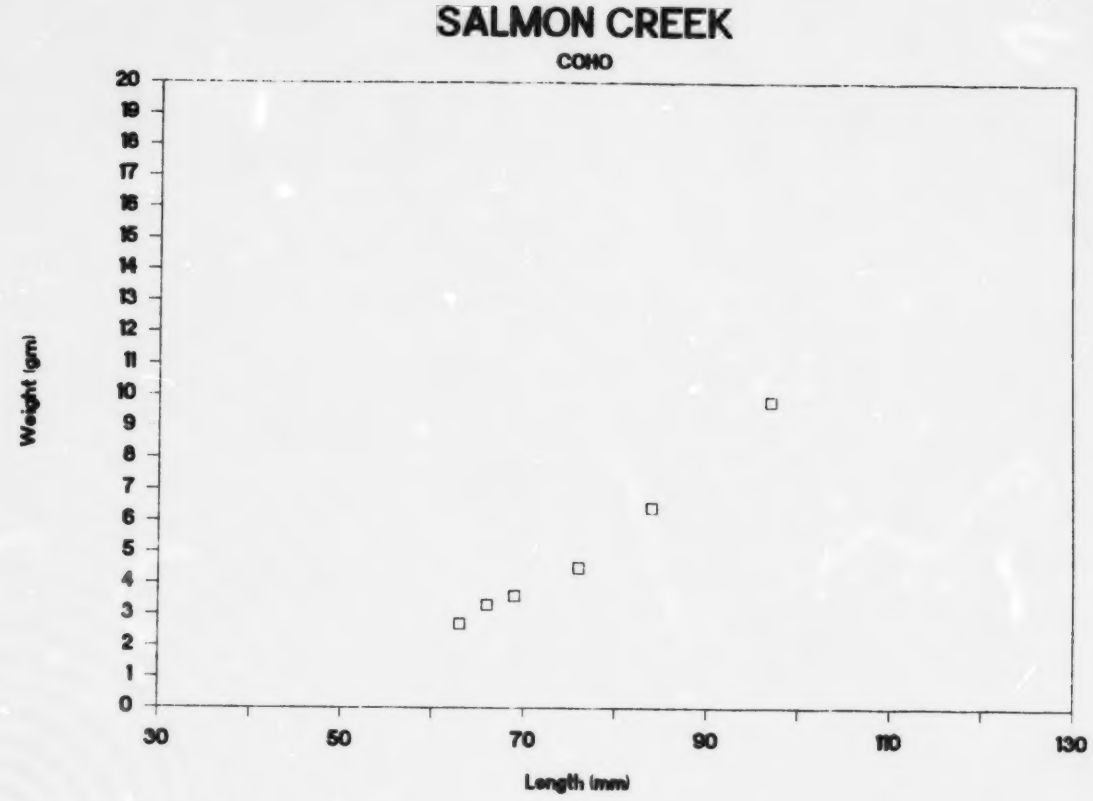
KOOTOWIS RIVER

COHO




LOST SHOE CREEK
COHO
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)


LOST SHOE CREEK
COHO
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)


SALMON CREEK
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
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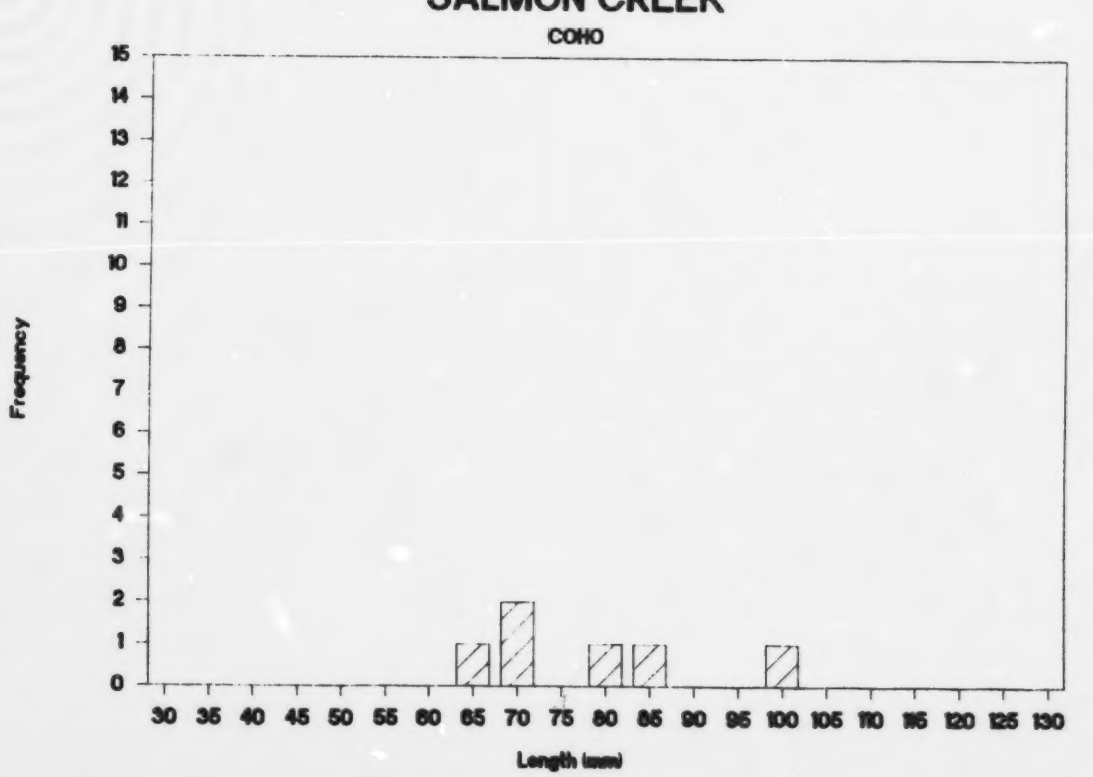
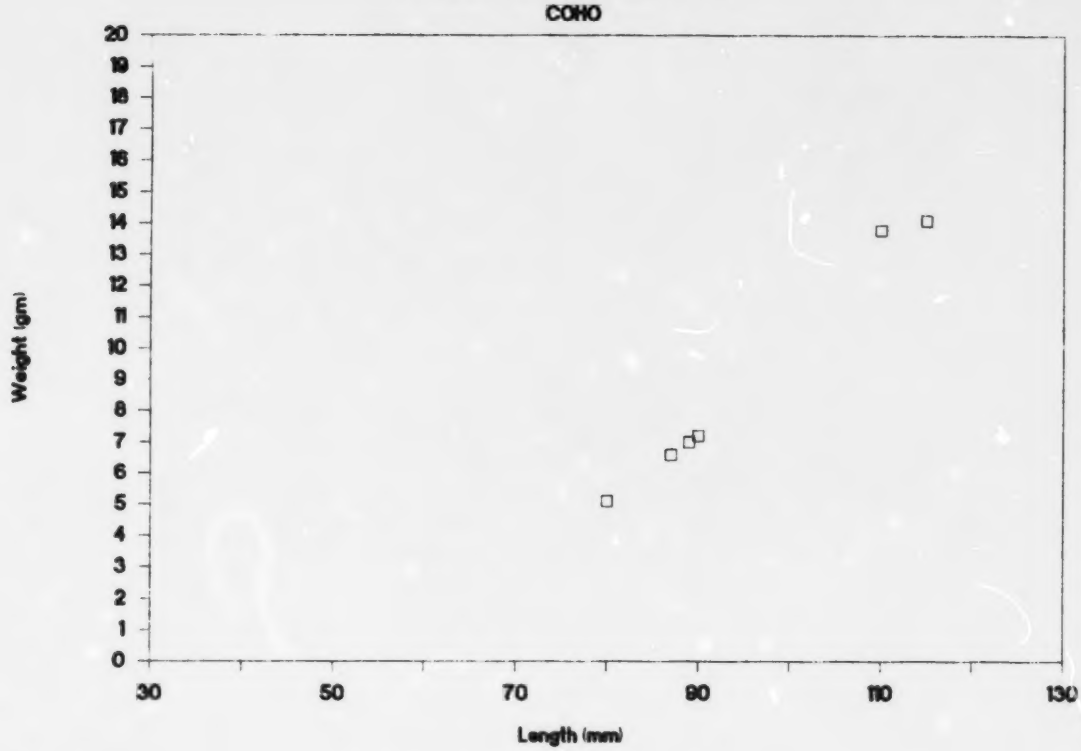
17
18
19
20
30
50
70
90
110
130


SALMON CREEK
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130

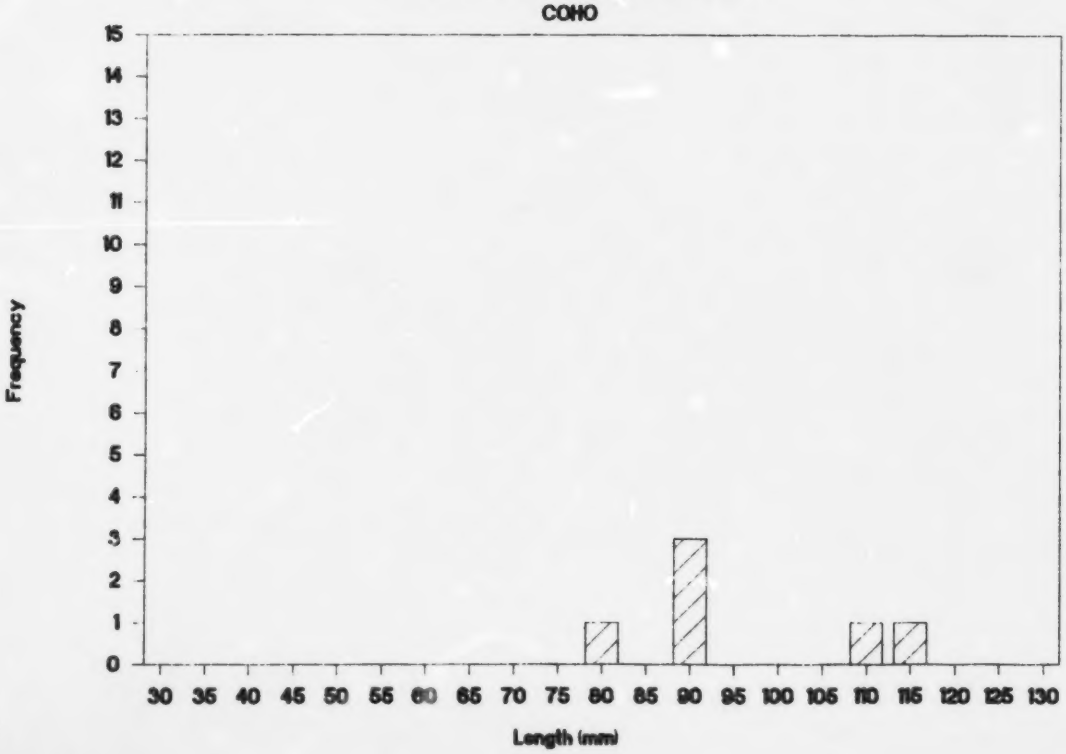
STAGHORN CREEK

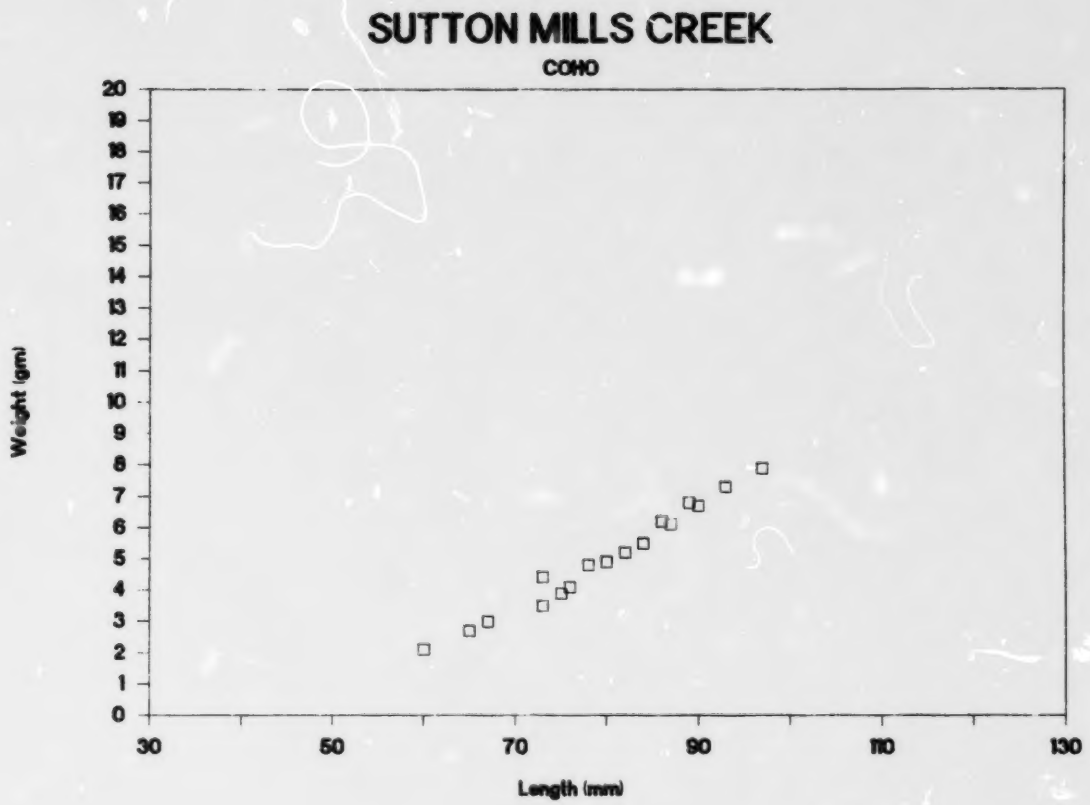
COHO



STAGHORN CREEK

COHO




SUTTON MILLS CREEK
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
8
9
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11
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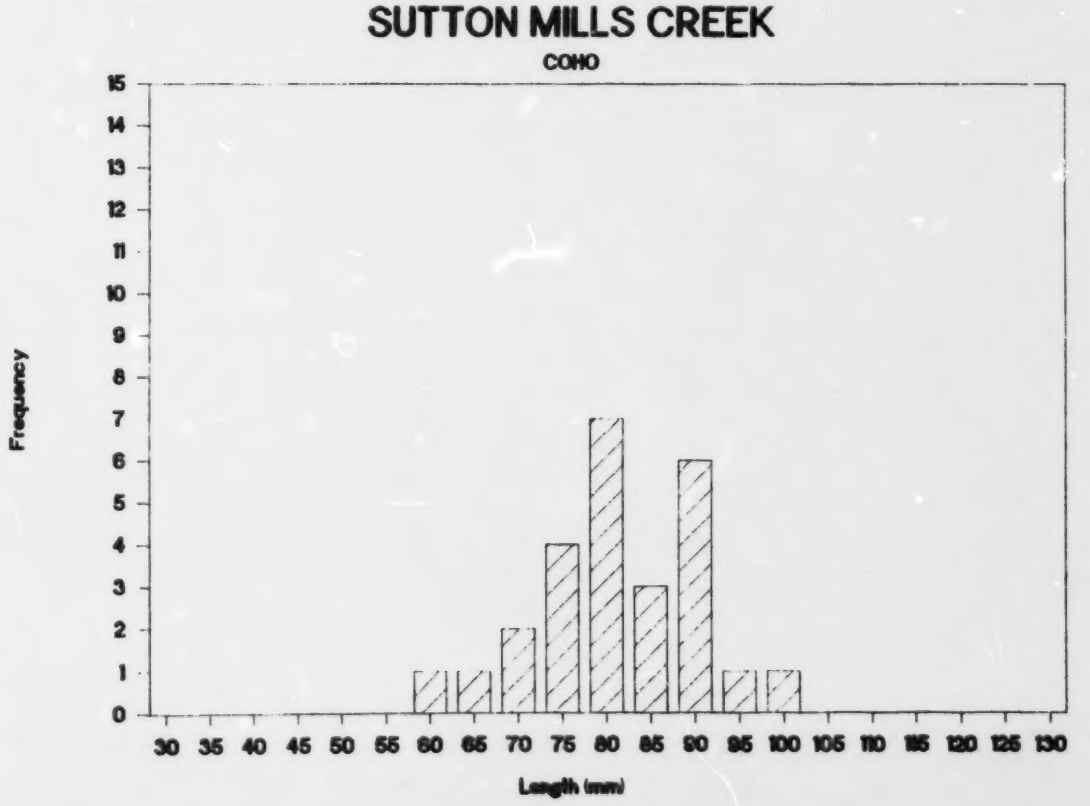
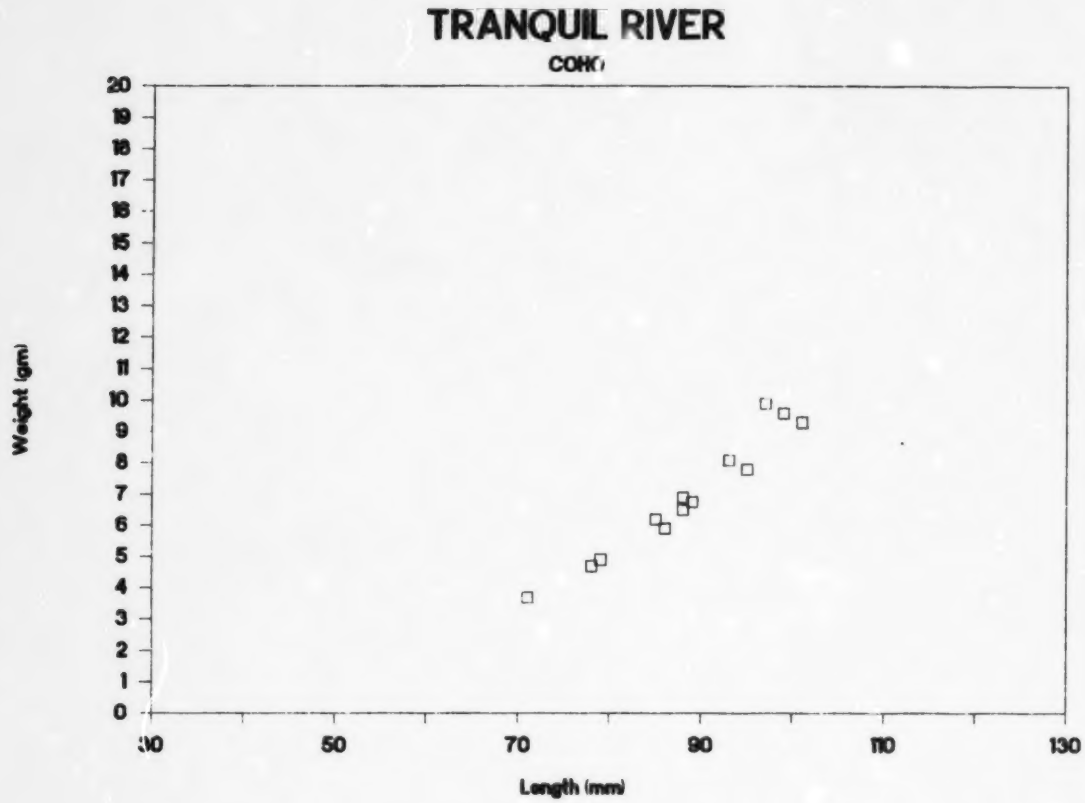
17
18
19
20
30
50
70
90
110
130


SUTTON MILLS CREEK
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


TRANQUIL RIVER
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
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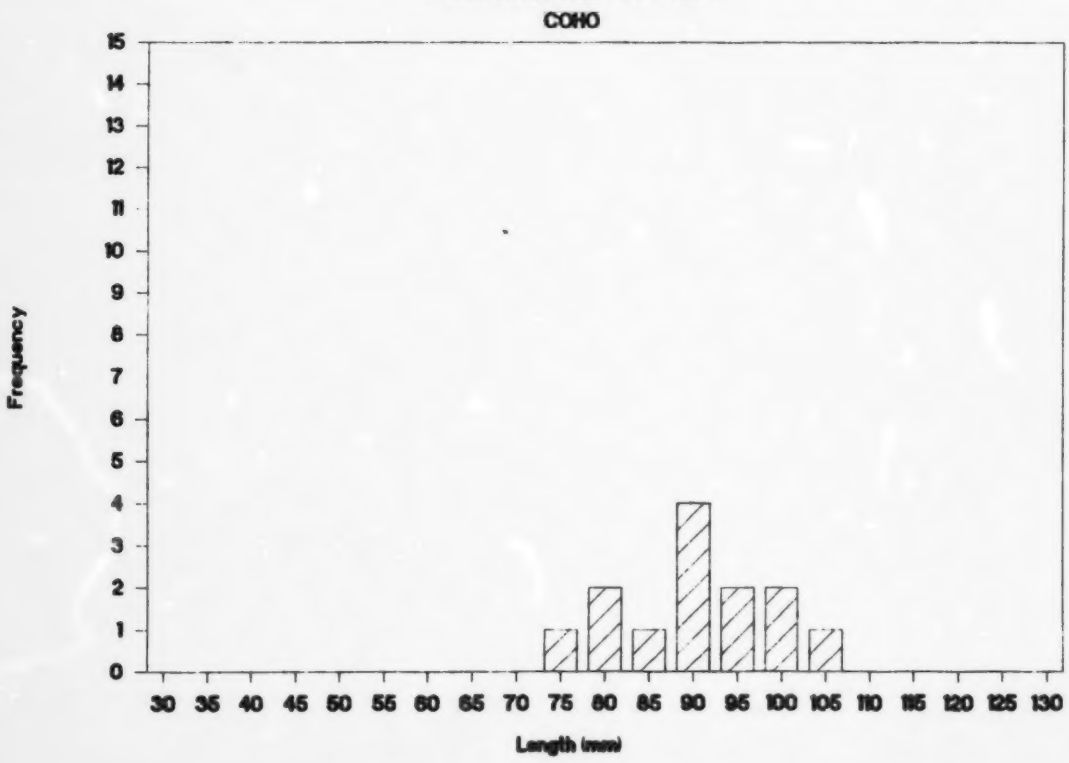
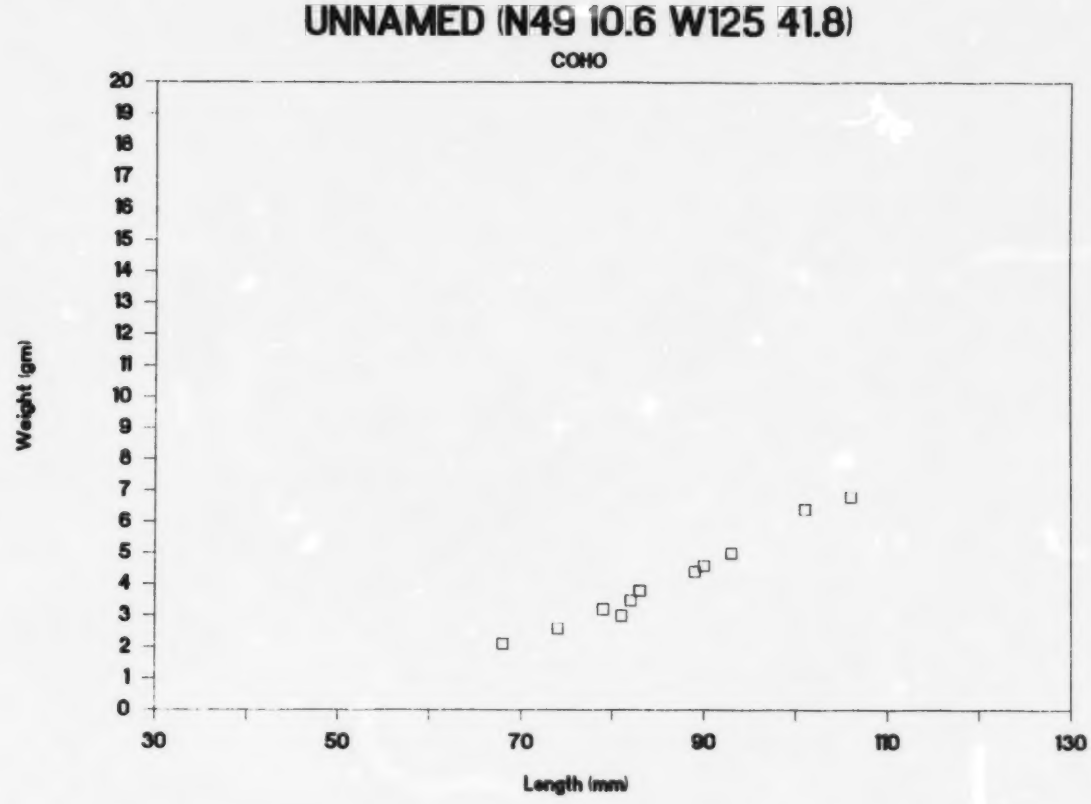
16
17
18
19
20
50
70
90
110
130


TRANQUIL RIVER
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


UNNAMED (N49 10.6 W125 41.8)
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
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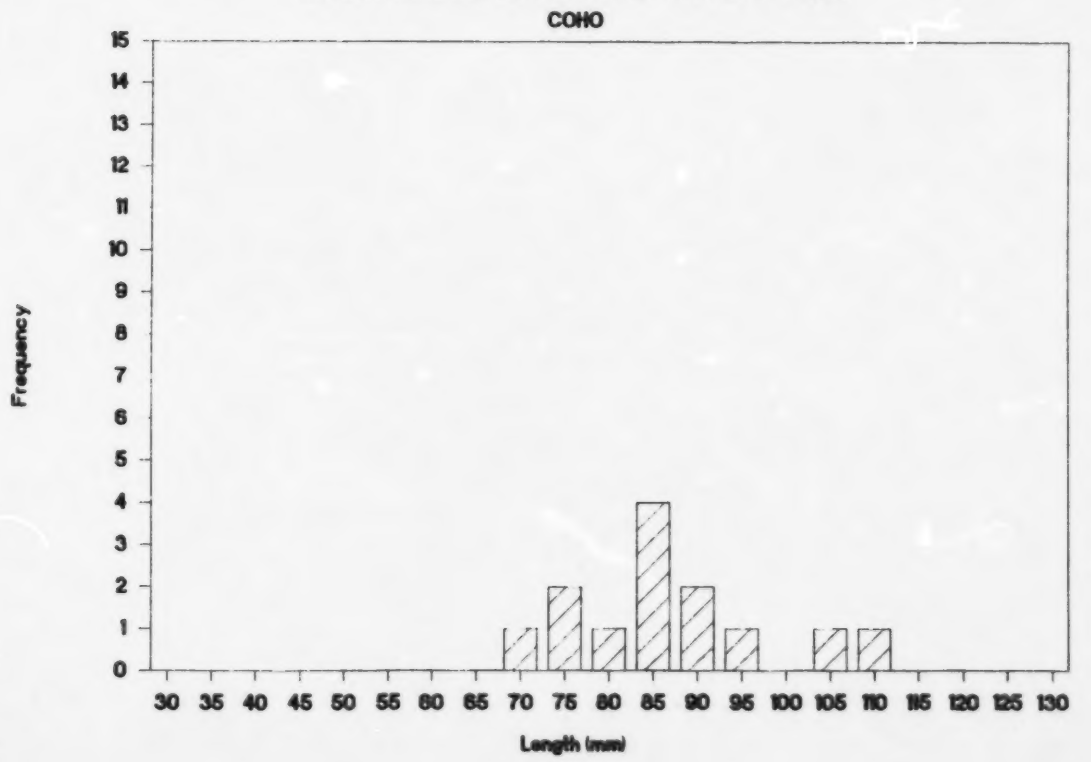
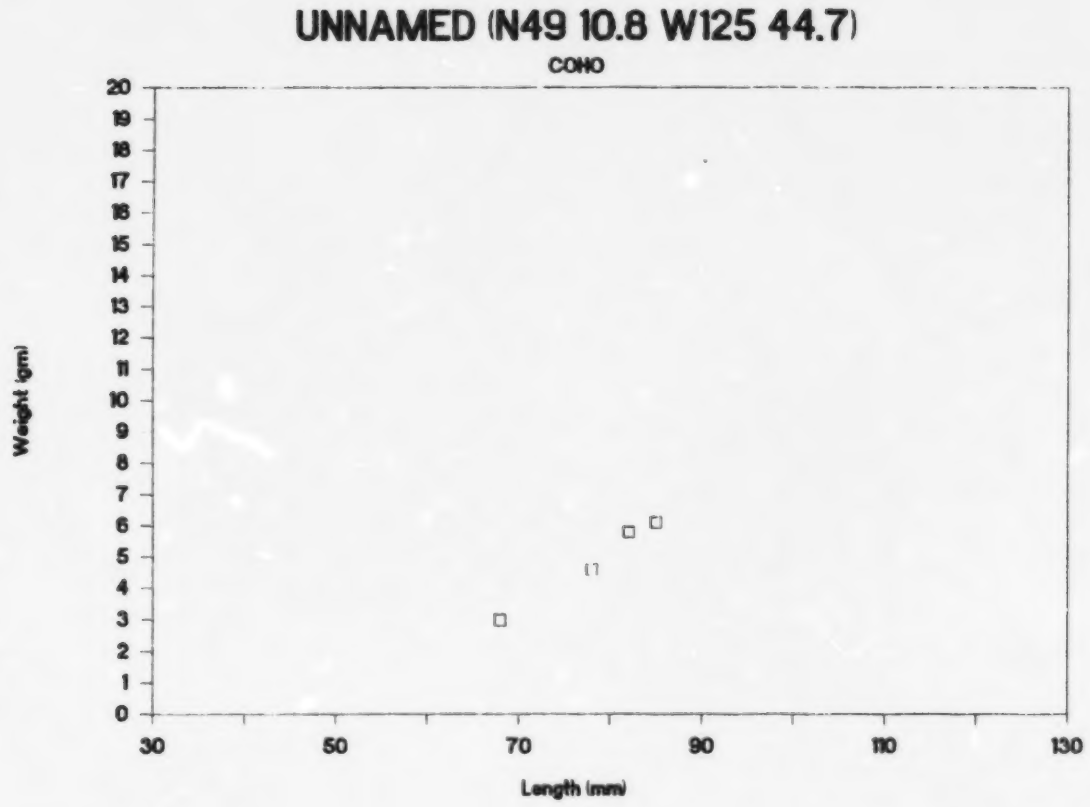
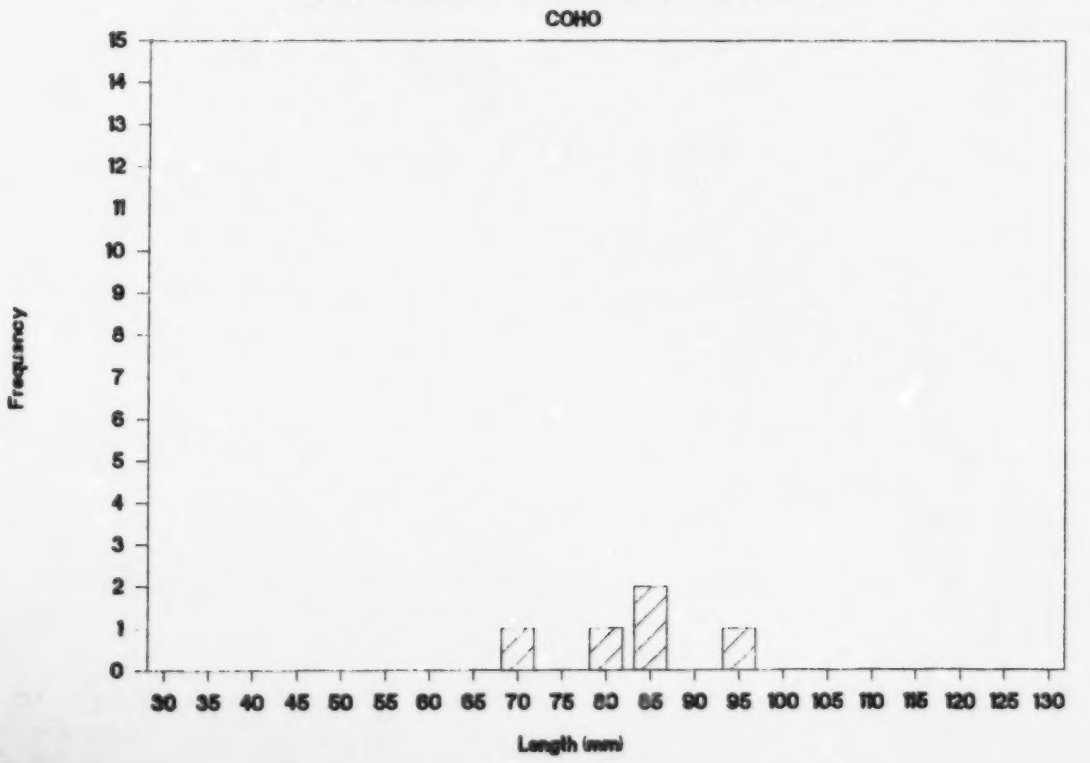
17
18
19
20
30
50
70
90
110
130


UNNAMED (N49 10.6 W125 41.8)
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


UNNAMED (N49 10.8 W125 44.7)
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130


UNNAMED (N49 10.8 W125 44.7)
COHO
Frequency
Length (mm)
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1
2
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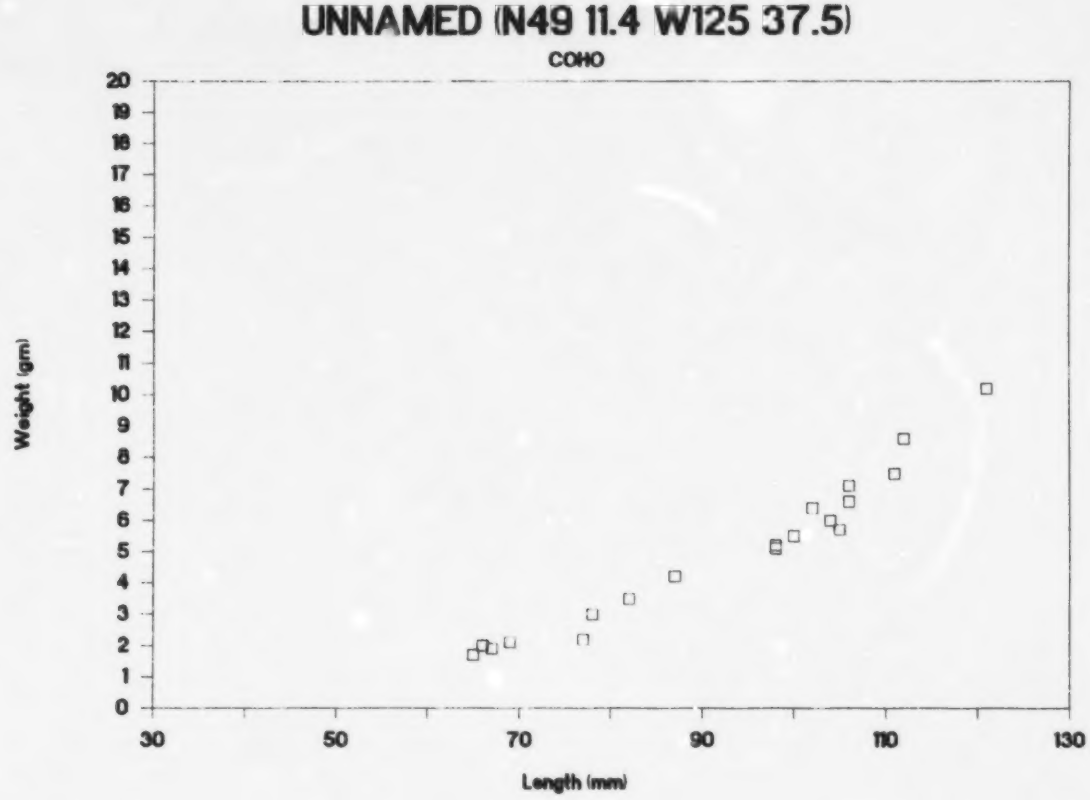
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


UNNAMED (N49 11.4 W125 37.5)
COHO
Weight (gm)
Length (mm)
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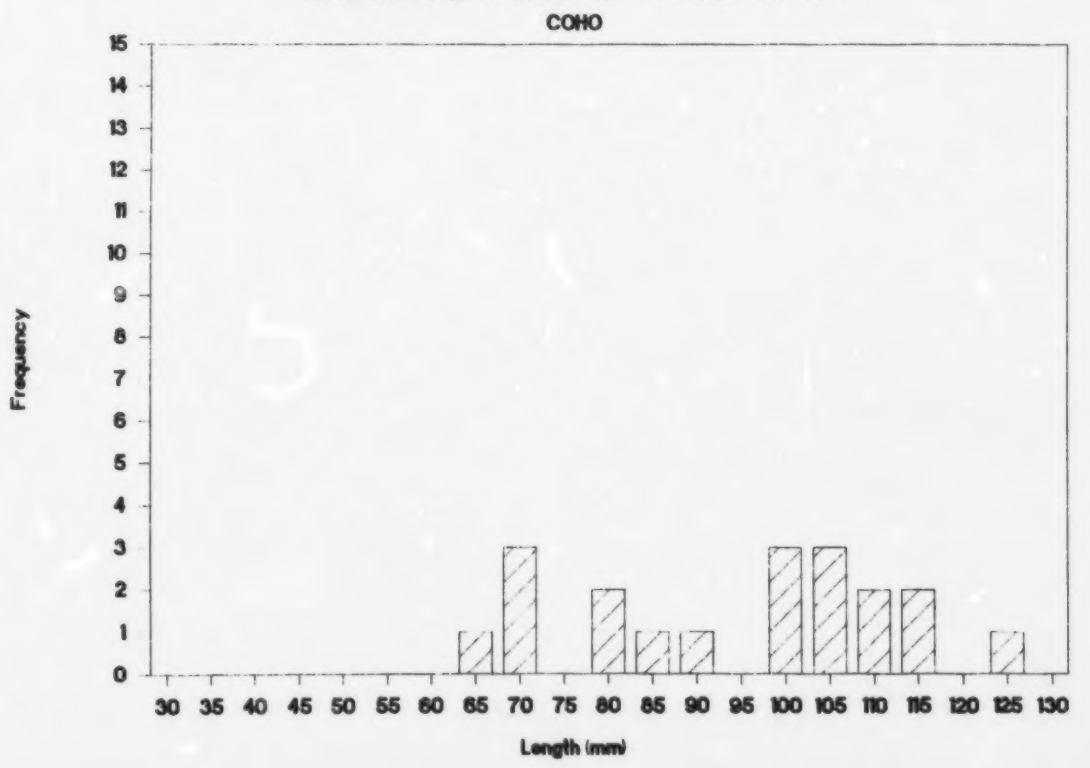
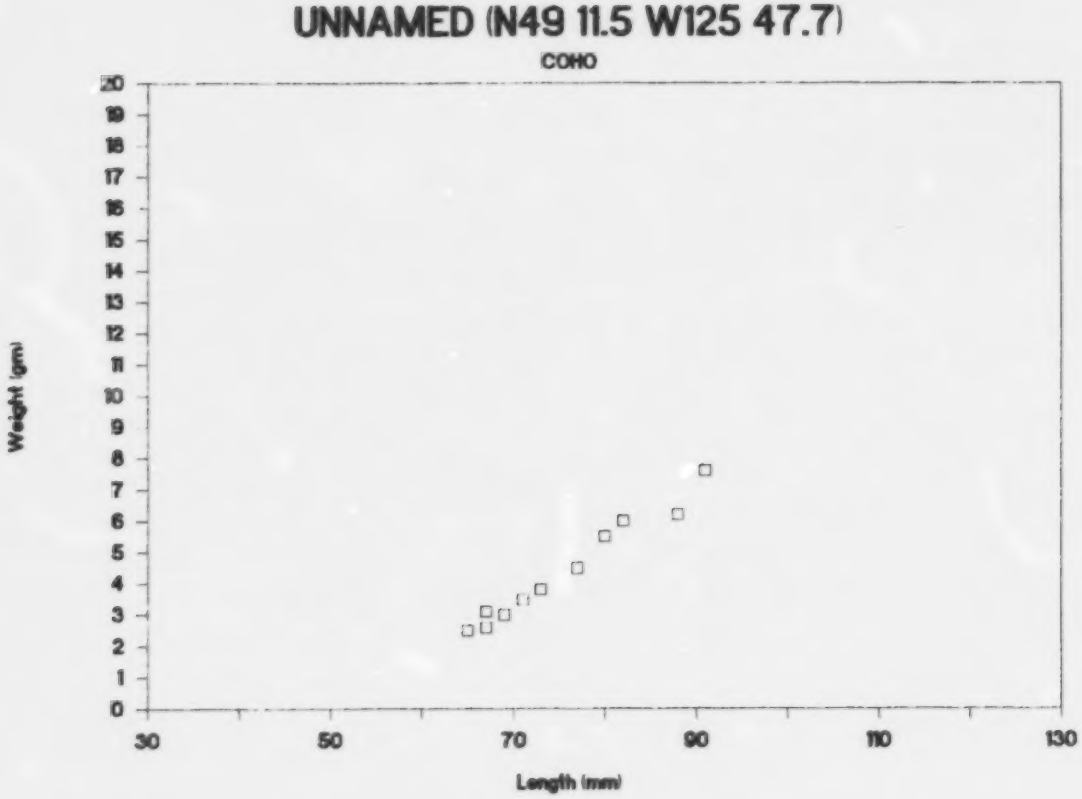
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130


UNNAMED (N49 11.4 W125 37.5)
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


UNNAMED (N49 11.5 W125 47.7)
COHO
Weight (gm)
0
1
2
3
4
5
6
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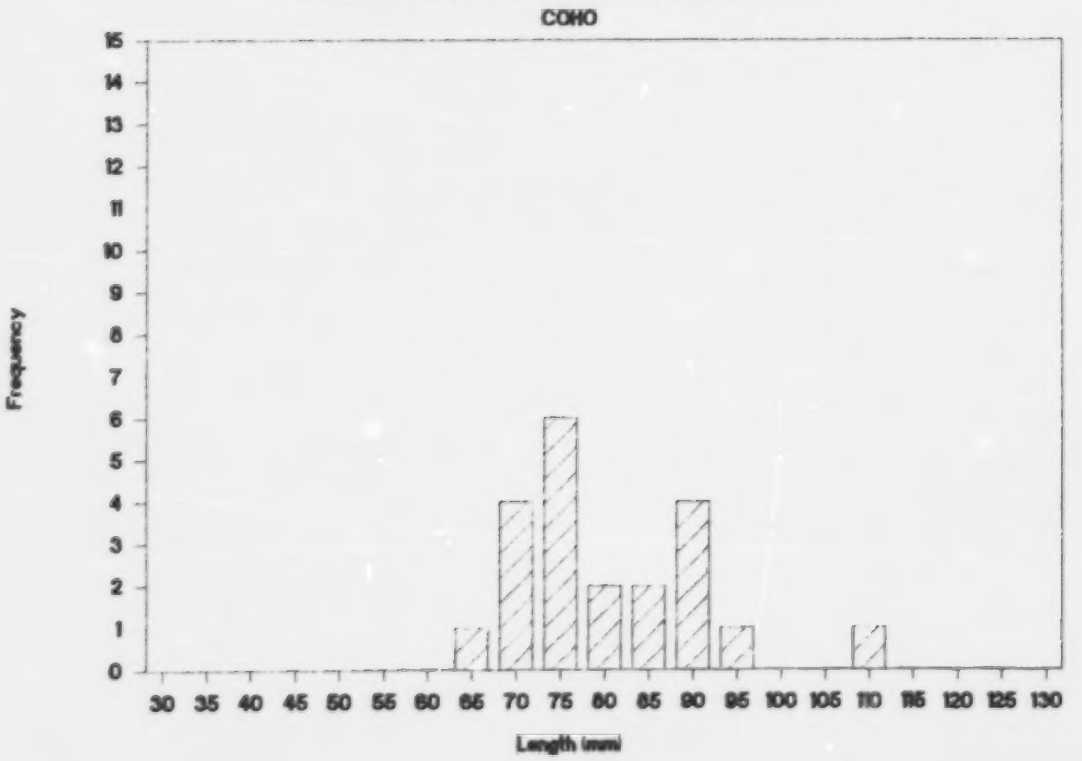
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)


UNNAMED (N49 11.5 W125 47.7)
COHO
Frequency
0
1
2
3
4
5
6
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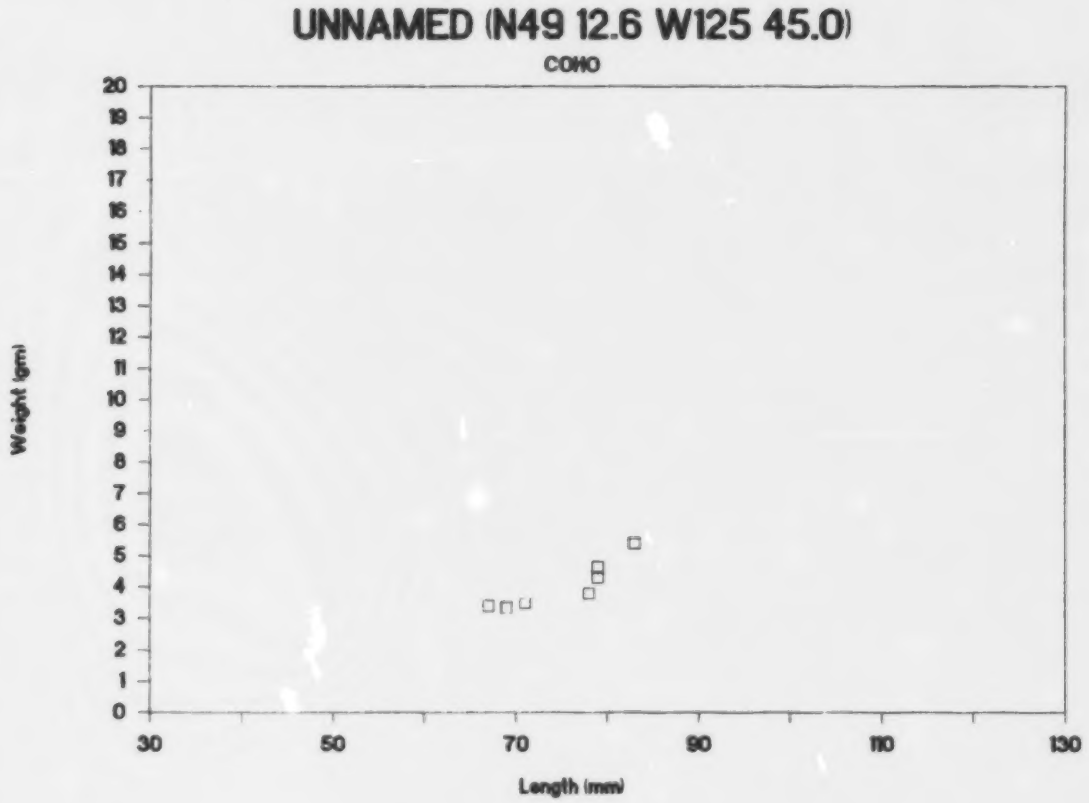
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)


UNNAMED (N49 12.6 W125 45.0)
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
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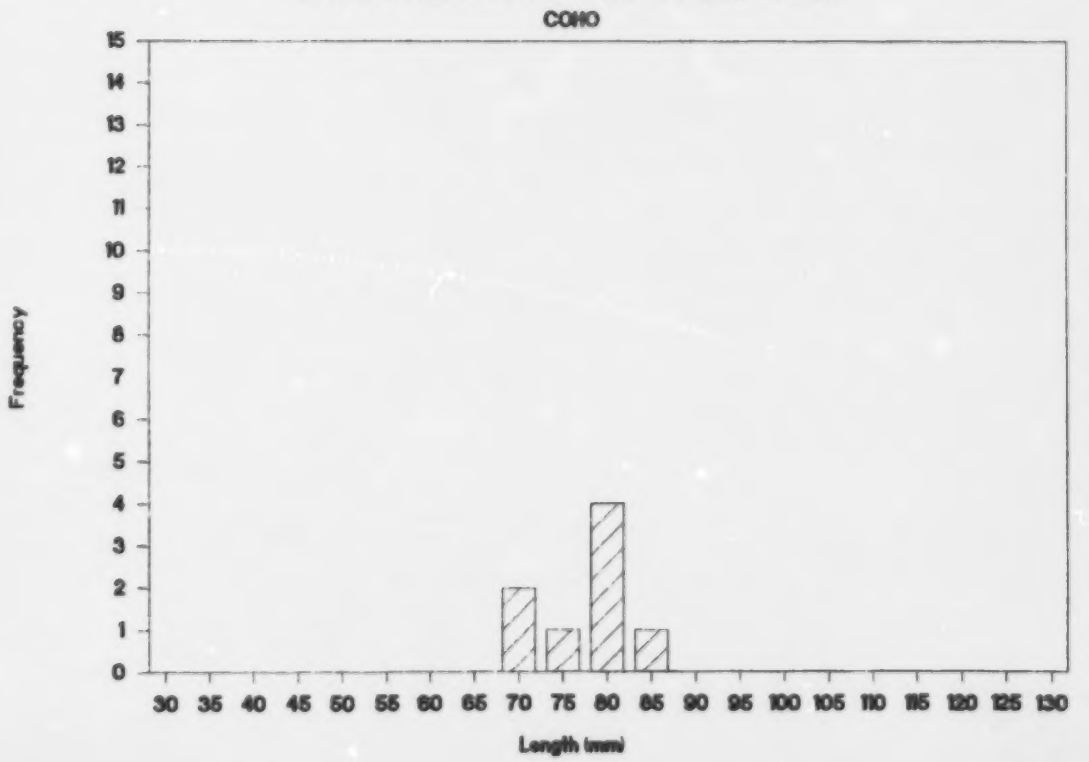
UNNAMED (N49 12.6 W125 45.0)
COHO
Frequency
Length (mm)
0
1
2
3
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7
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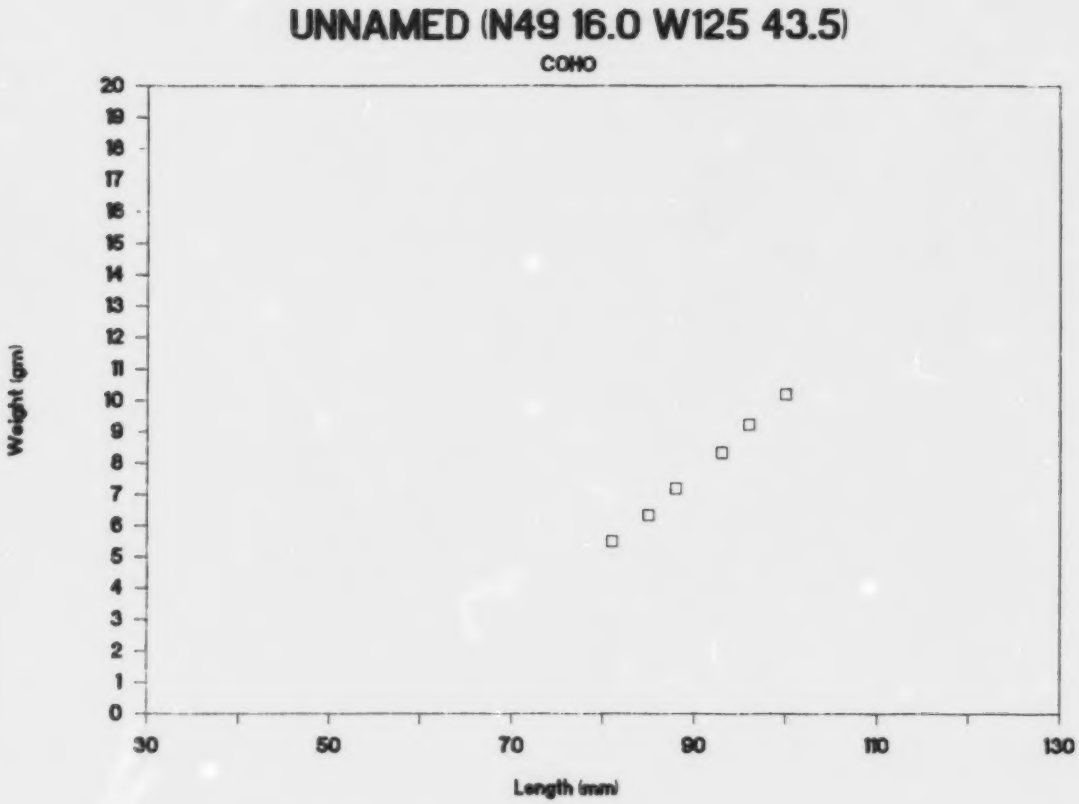
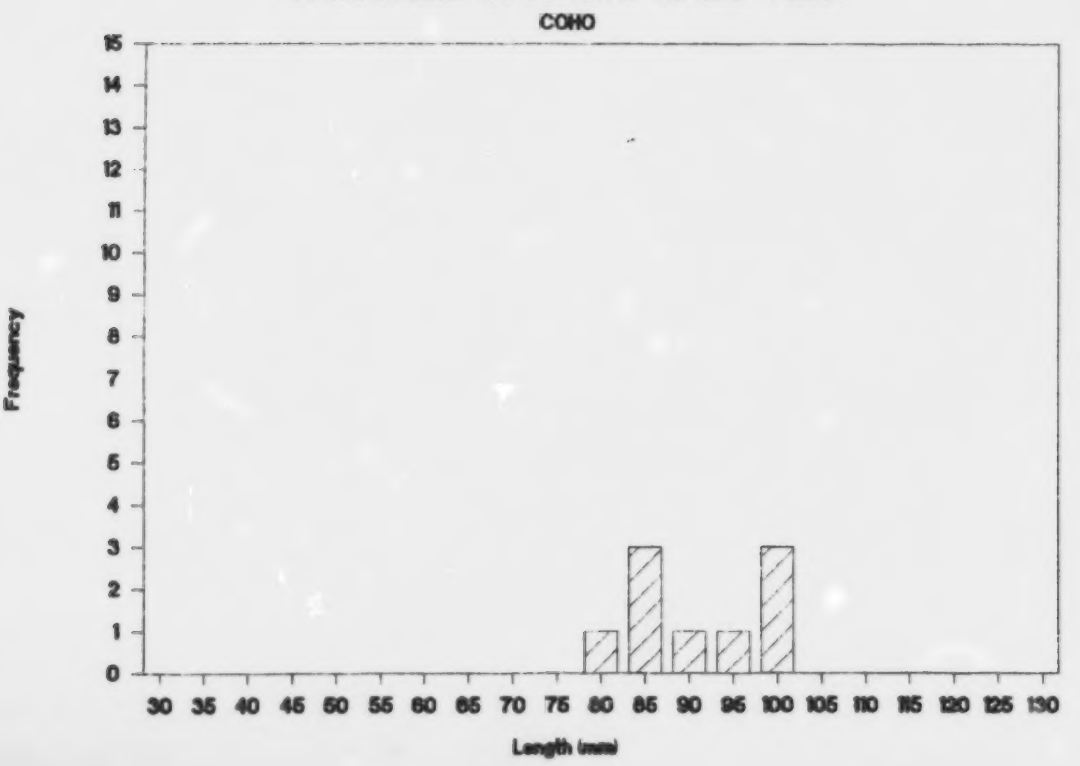
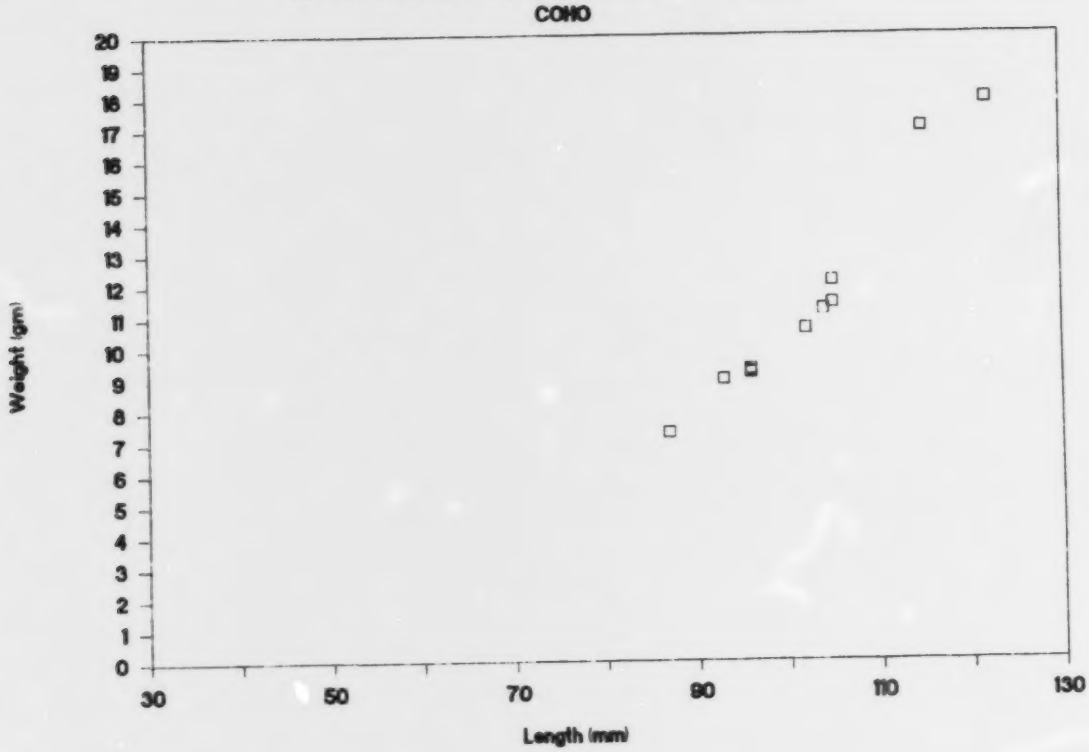
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130


UNNAMED (N49 16.0 W125 43.5)
COHO
Weight (gm)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
30 50 70 90 110 130
Length (mm)


UNNAMED (N49 16.0 W125 43.5)
COHO
Frequency
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)

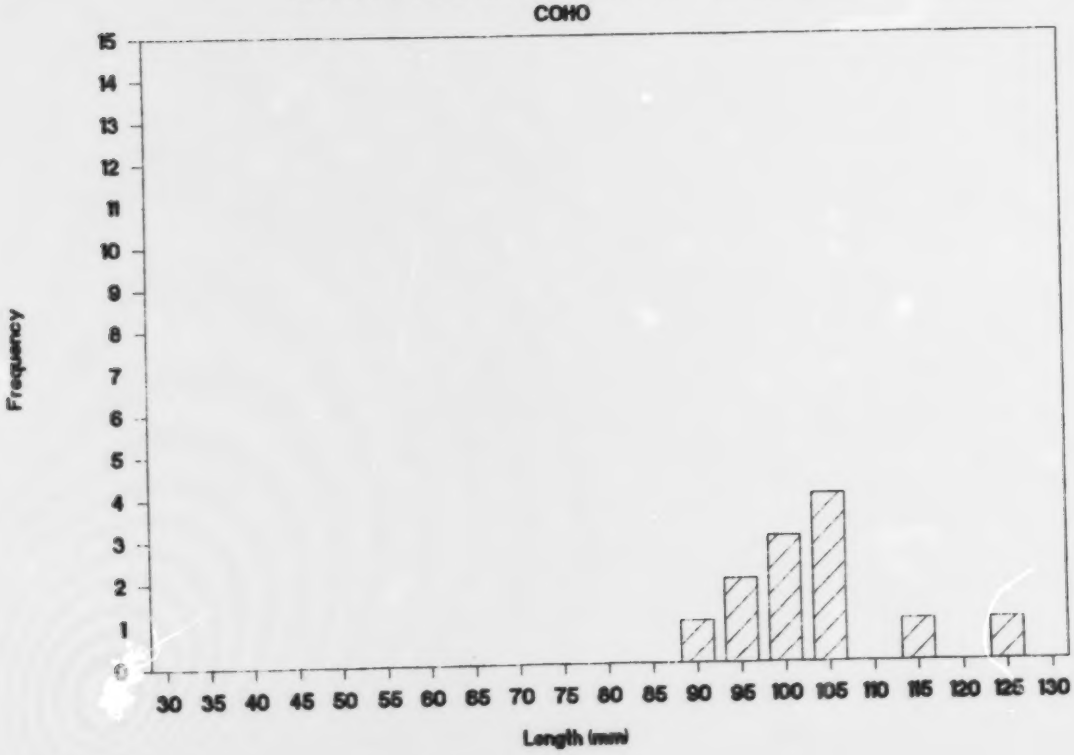
UNNAMED (N49 4.4 W125 32.5)

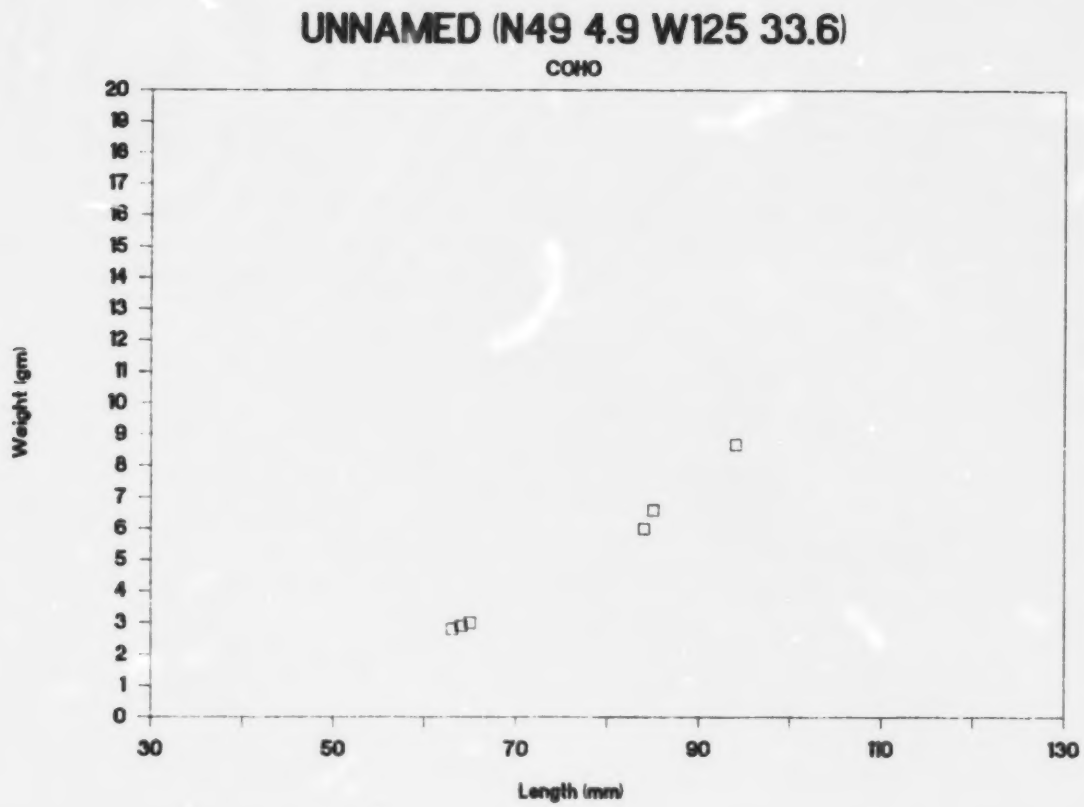
COHO

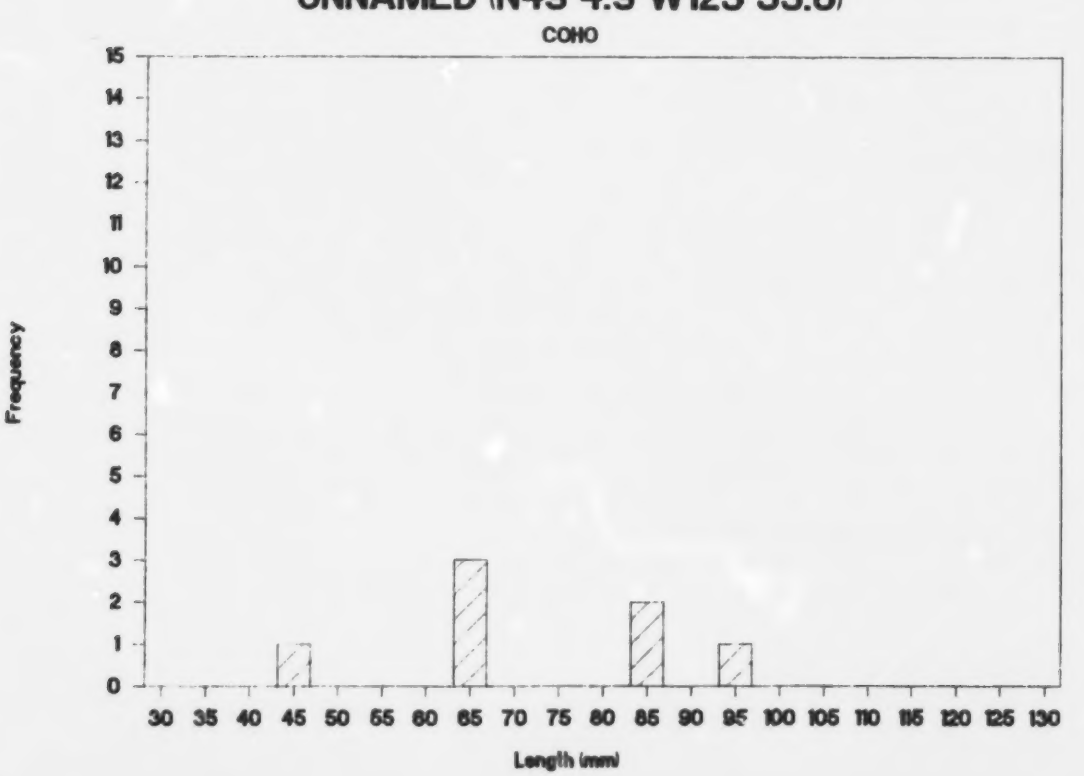


UNNAMED (N49 4.4 W125 32.5)

COHO




UNNAMED (N49 4.9 W125 33.6)
COHO
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
30
50
70
90
110
130
Length (mm)


UNNAMED (N49 4.9 W125 33.6)
COHO
Frequency
0
1
2
3
4
5
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7
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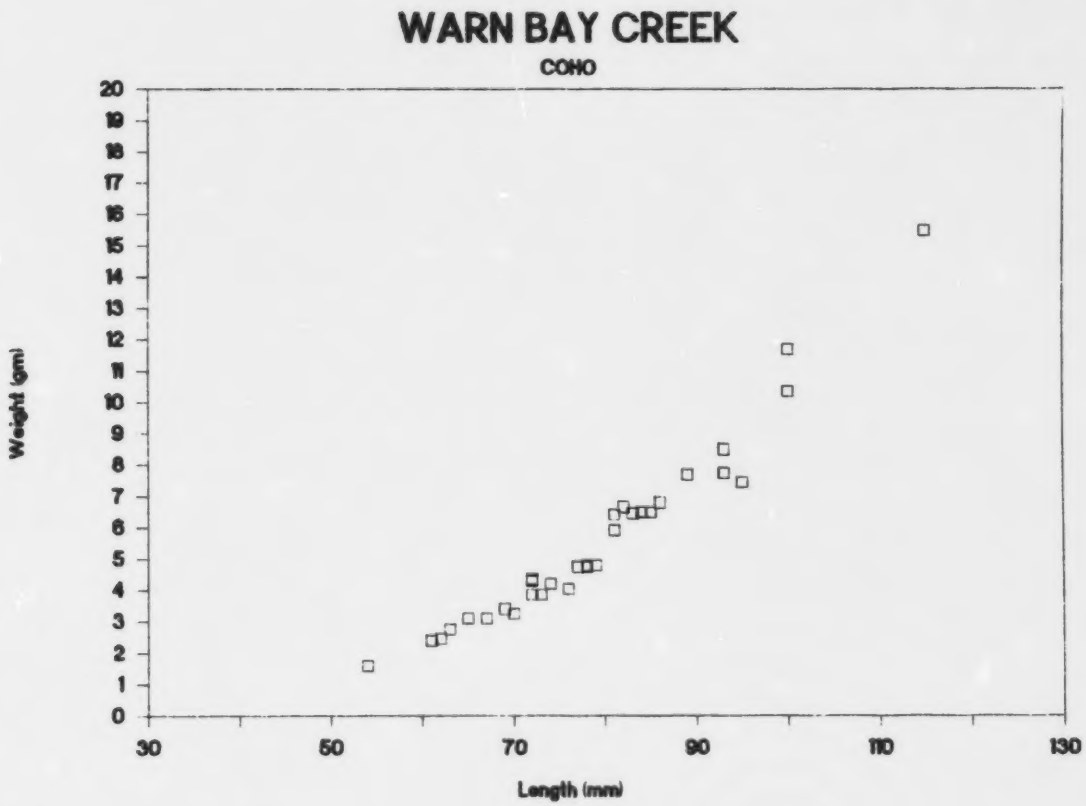
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130
Length (mm)


WARN BAY CREEK
COHO
Weight (gm)
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
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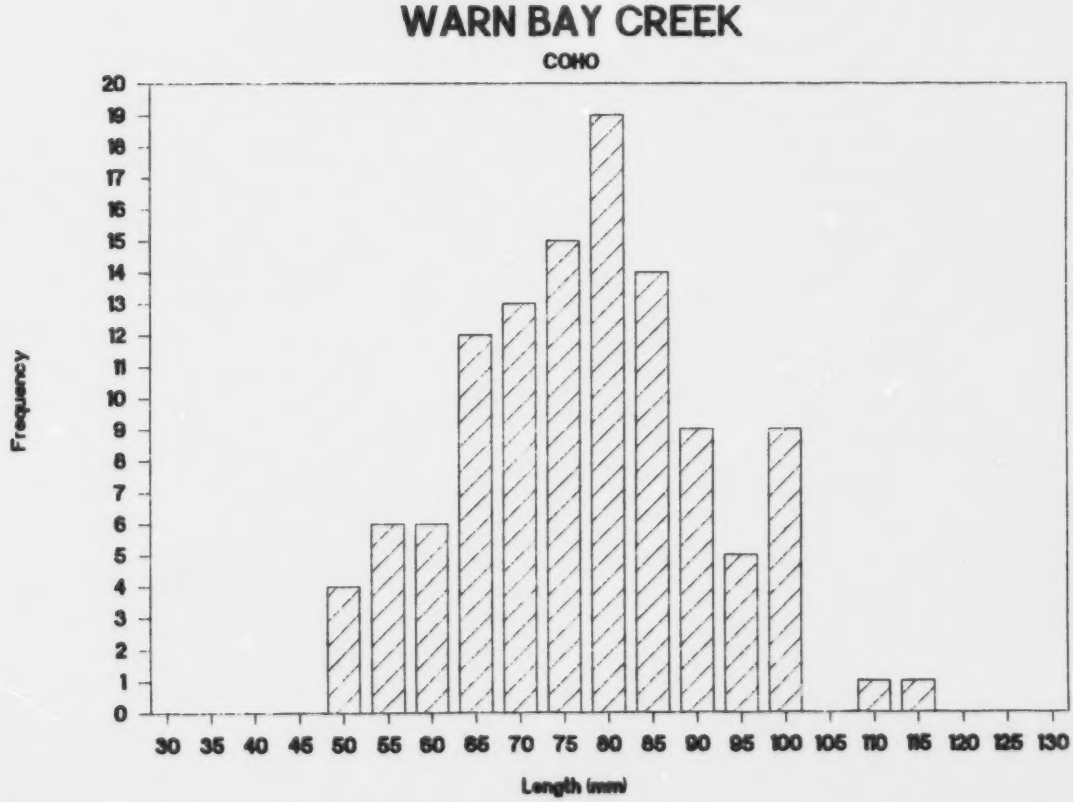
19
20
30
50
70
90
110
130


WARN BAY CREEK
COHO
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
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100
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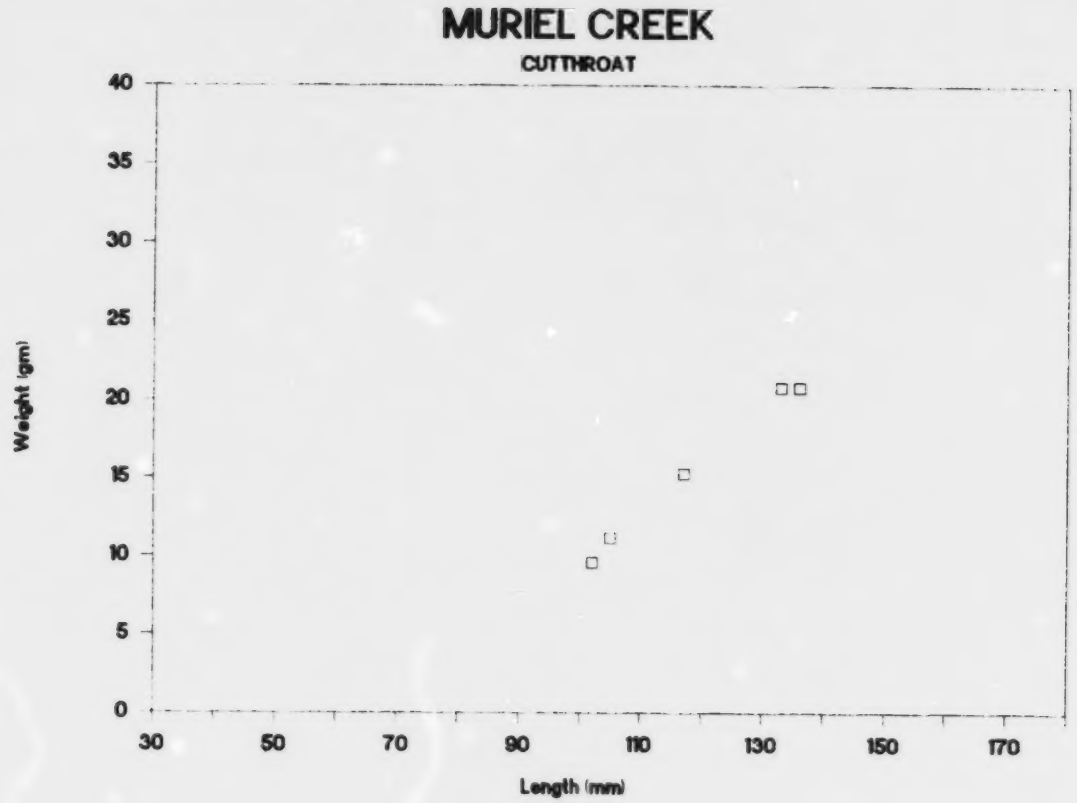
115
120
125
130


MURIEL CREEK
CUTTHROAT
Weight (gm)
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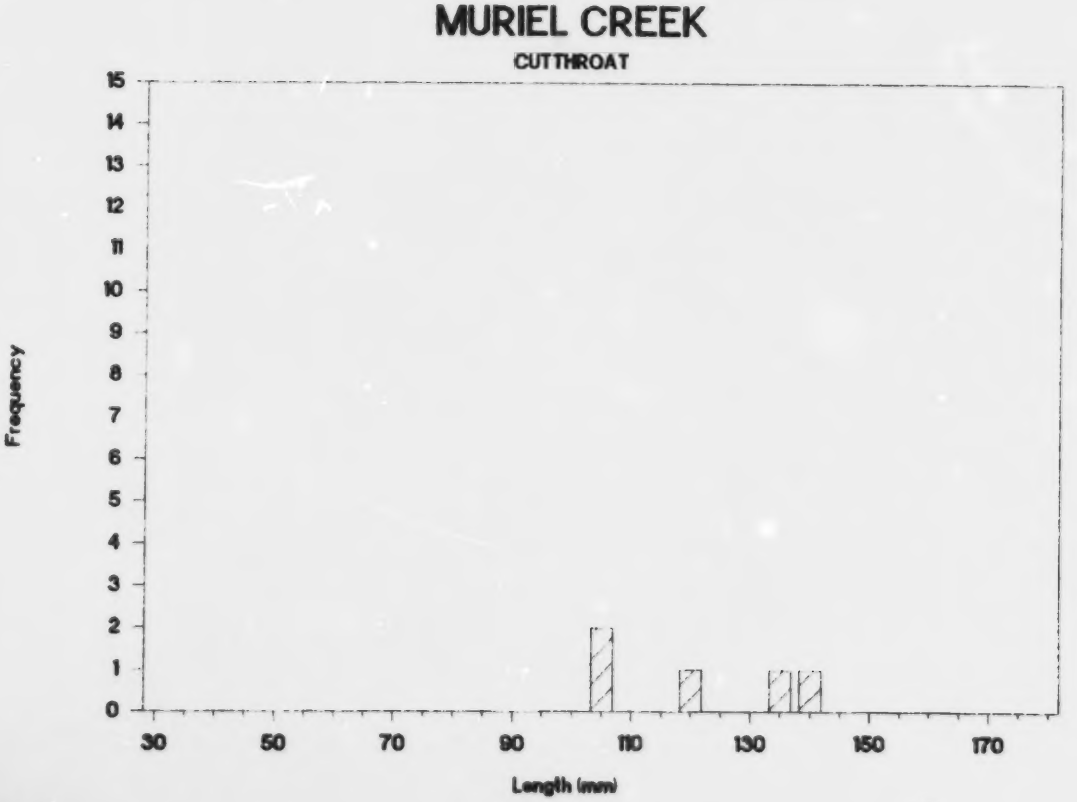
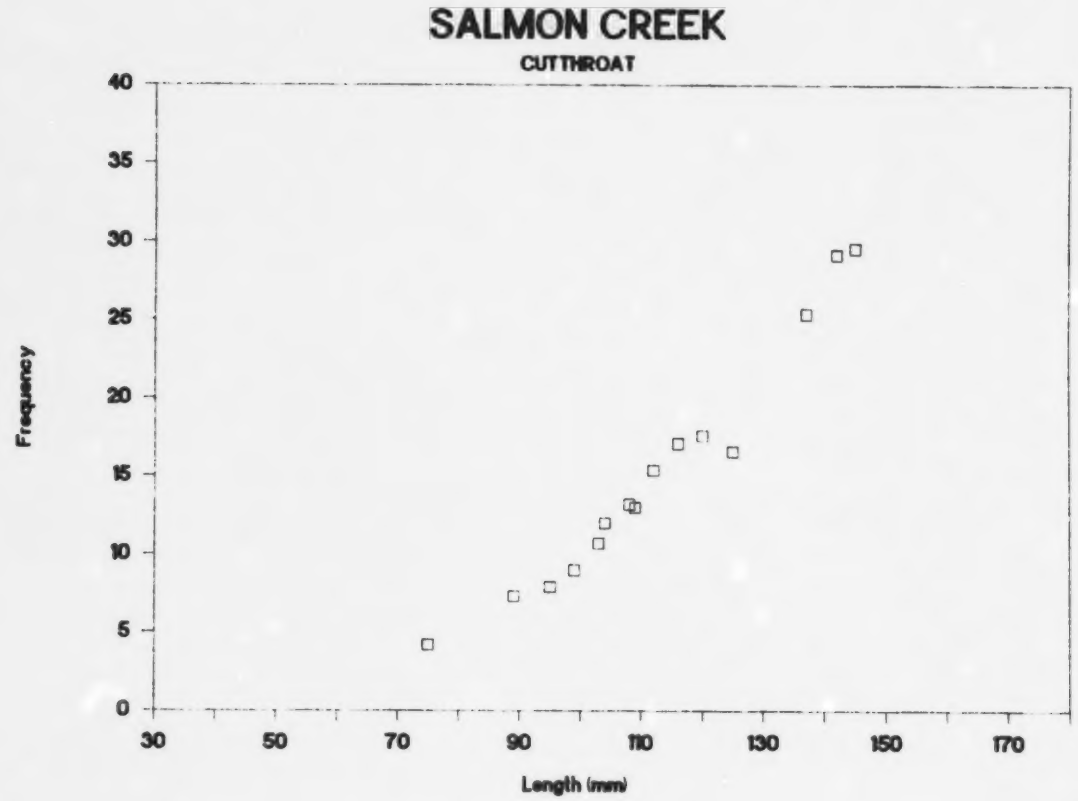
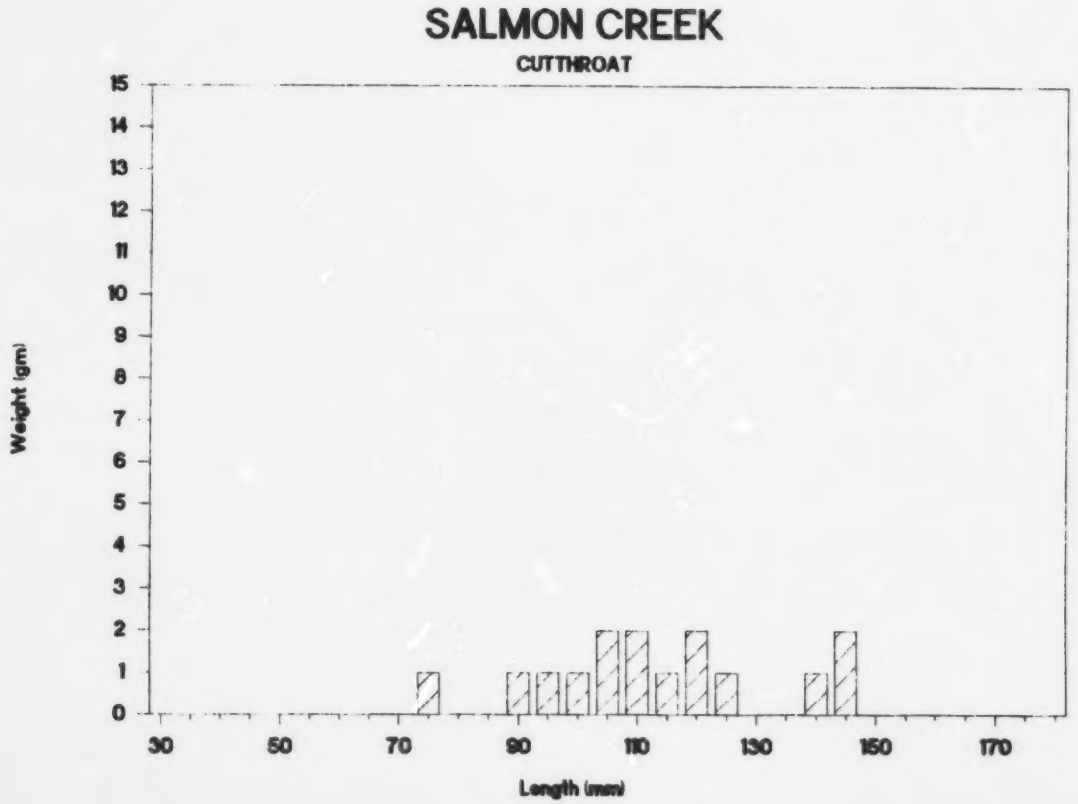
10
15
20
25
30
35
40
30
50
70
90
110
130
150
170
Length (mm)


MURIEL CREEK
CUTTHROAT
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30
50
70
90
110
130
150
170
Length (mm)


SALMON CREEK
CUTTHROAT
Frequency
0
5
10
15
20
25
30
35
40
30
50
70
90
110
130
150
170
Length (mm)


SALMON CREEK
CUTTHROAT
Weight (gm)
0
1
2
3
4
5
6
7
8
9
10
11
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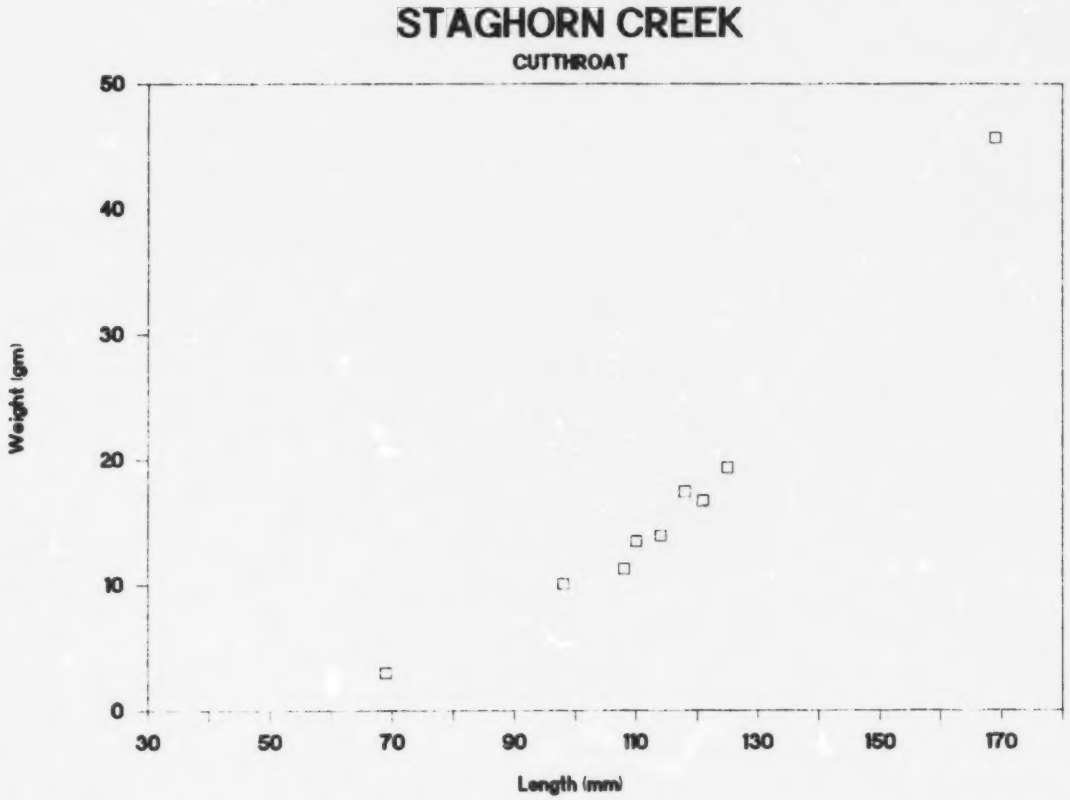
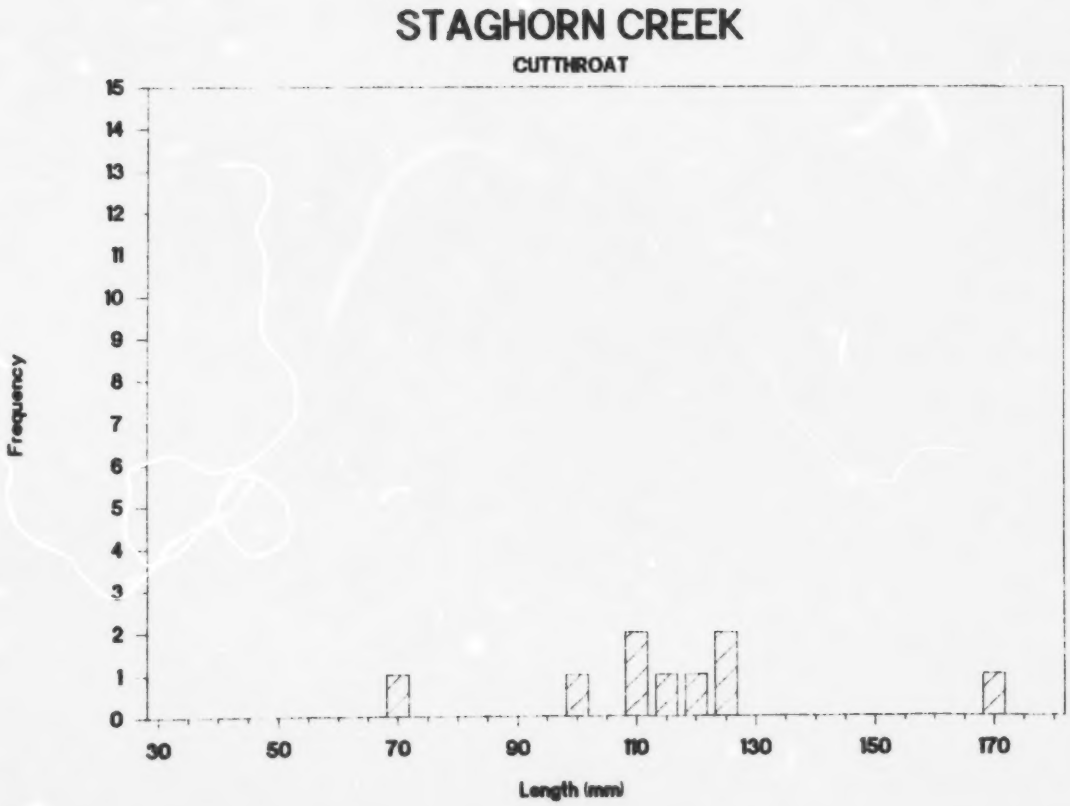
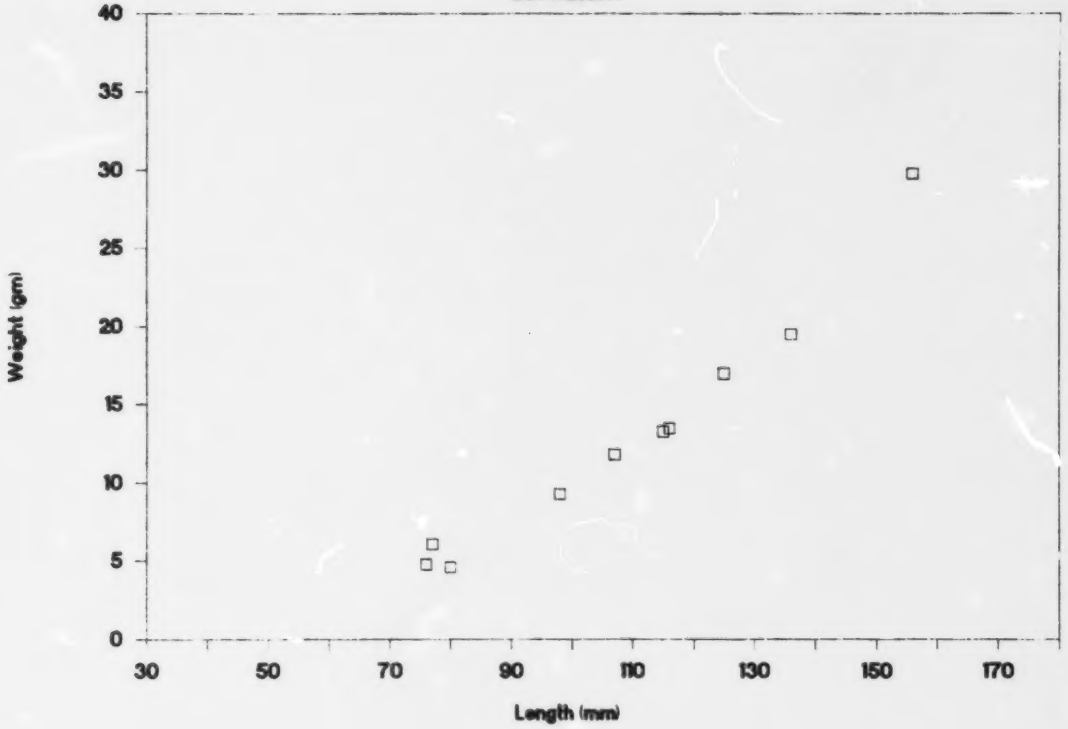
30
50
70
90
110
130
150
170
Length (mm)


STAGHORN CREEK
CUTTHROAT
Weight (gm)
0
10
20
30
40
50
30
50
70
90
110
130
150
170
Length (mm)


STAGHORN CREEK
CUTTHROAT
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30
50
70
90
110
130
150
170
Length (mm)

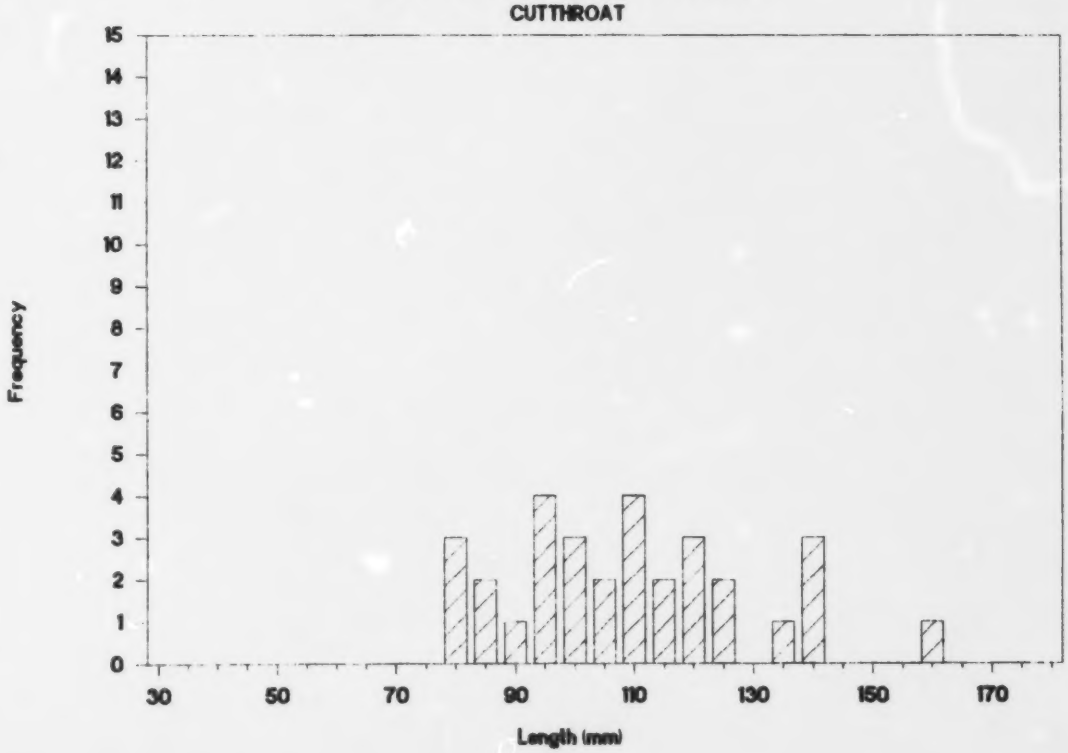
SUTTON MILLS CREEK

CUTTHROAT



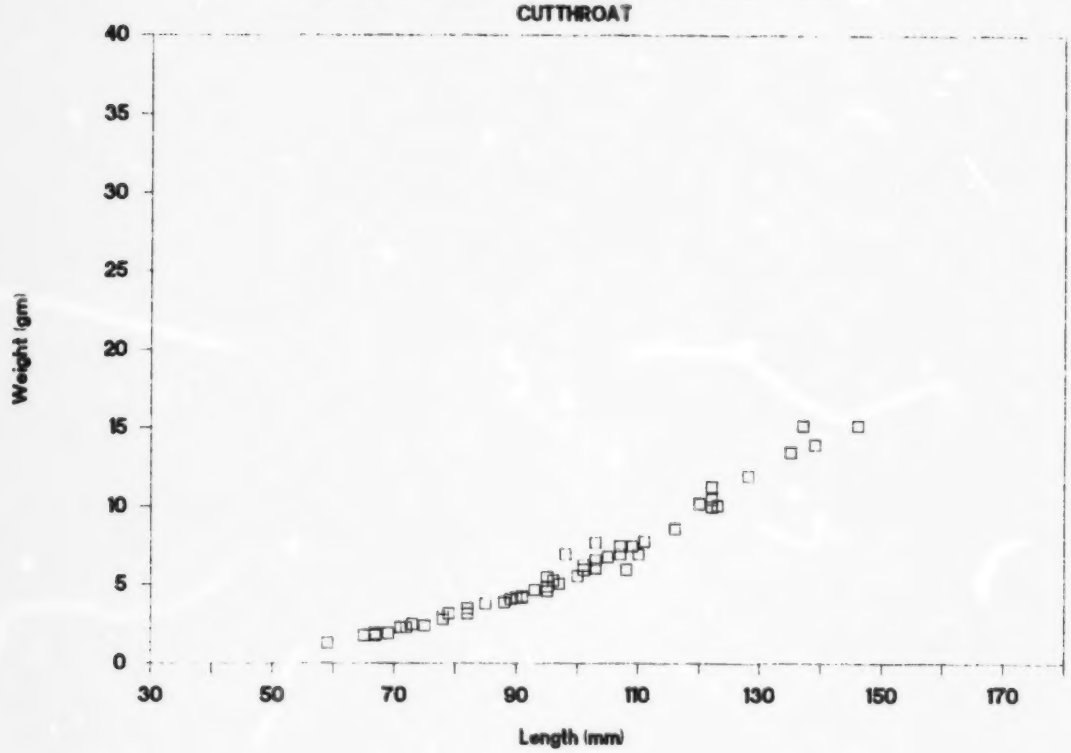
SUTTON MILLS CREEK

CUTTHROAT



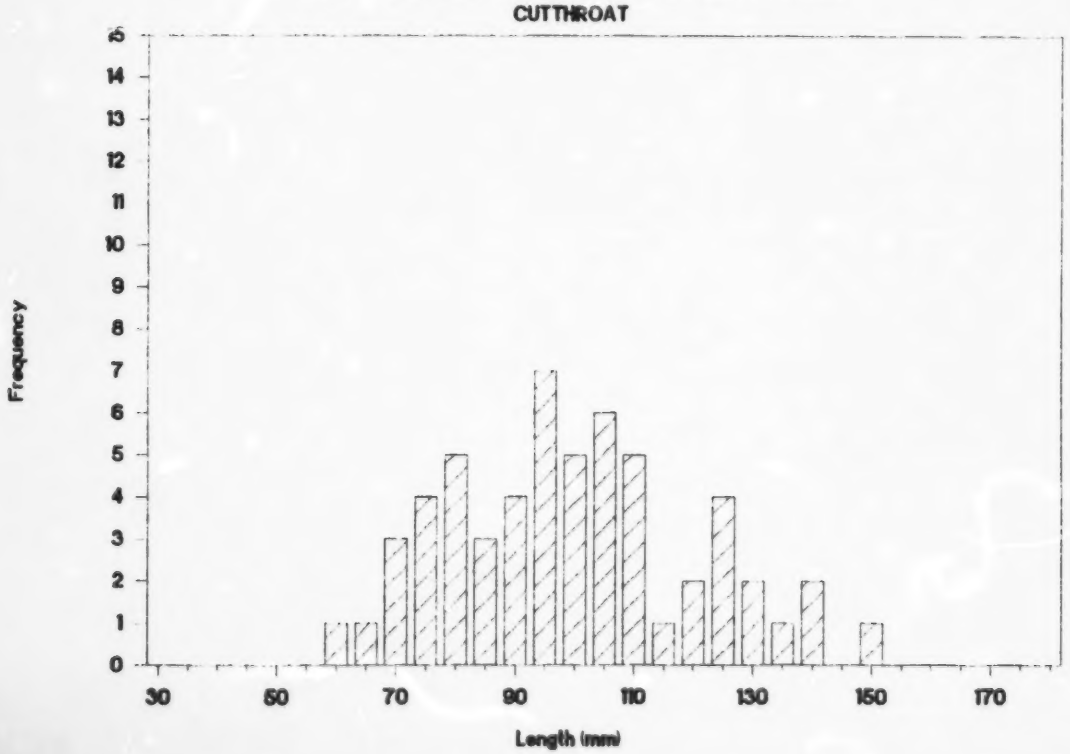
UNNAMED (N49 10.6 W125 41.8)

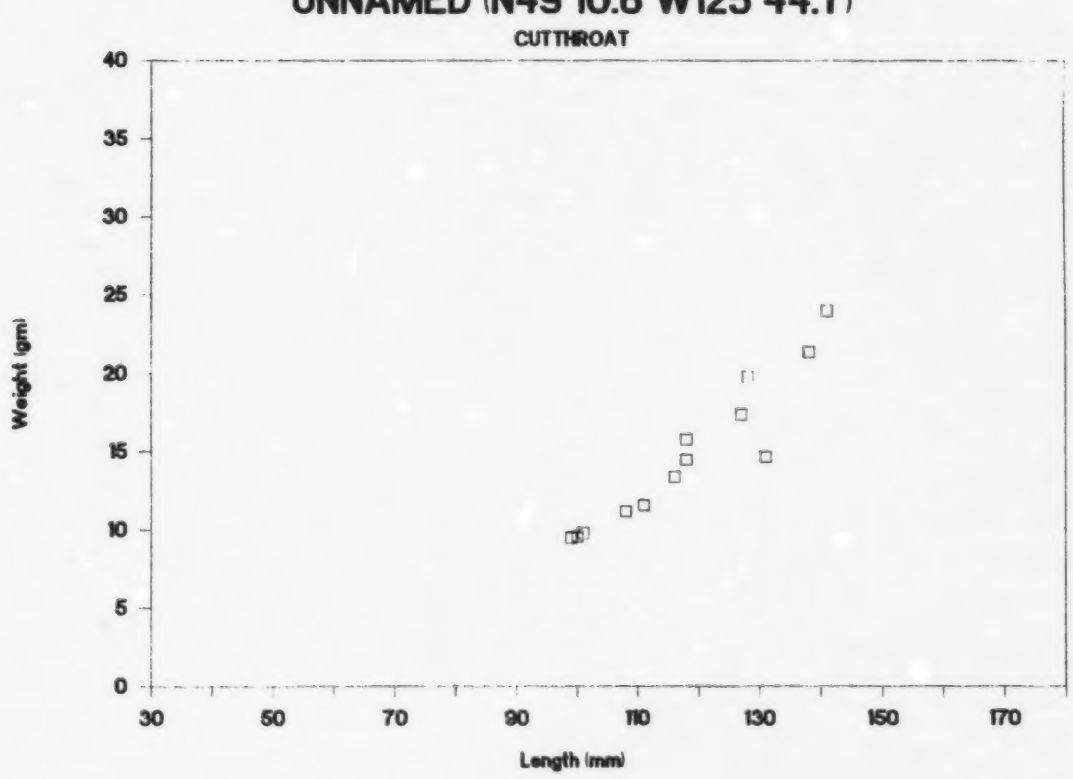
CUTTHROAT

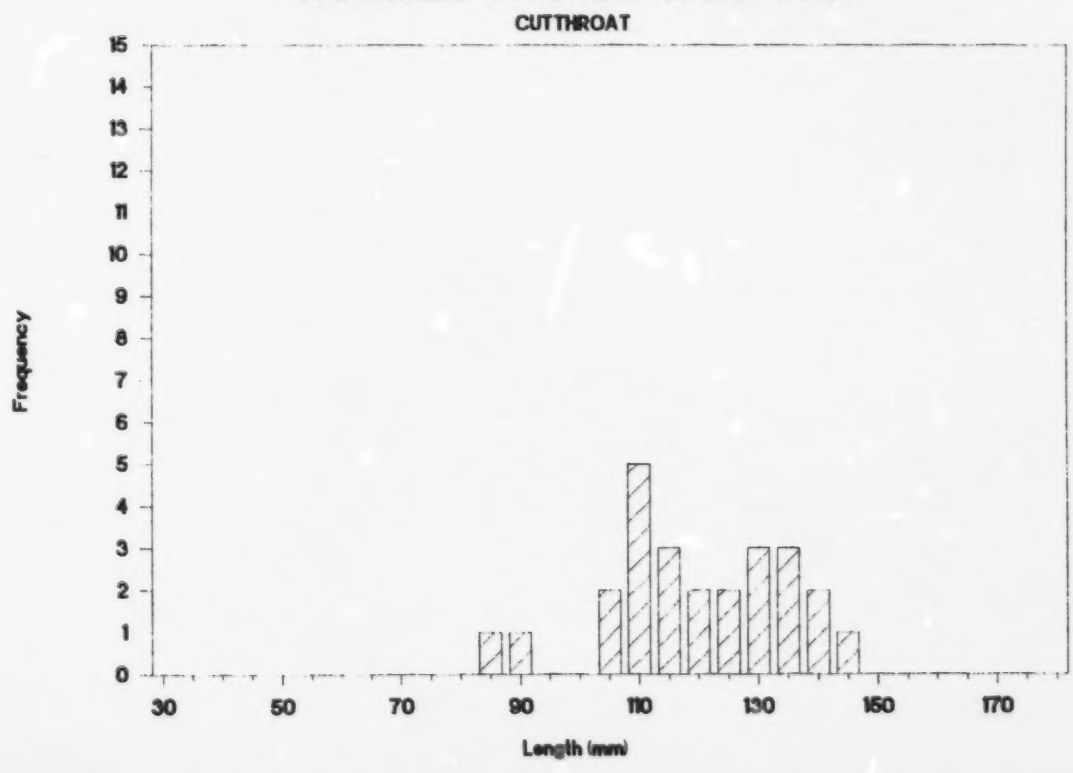


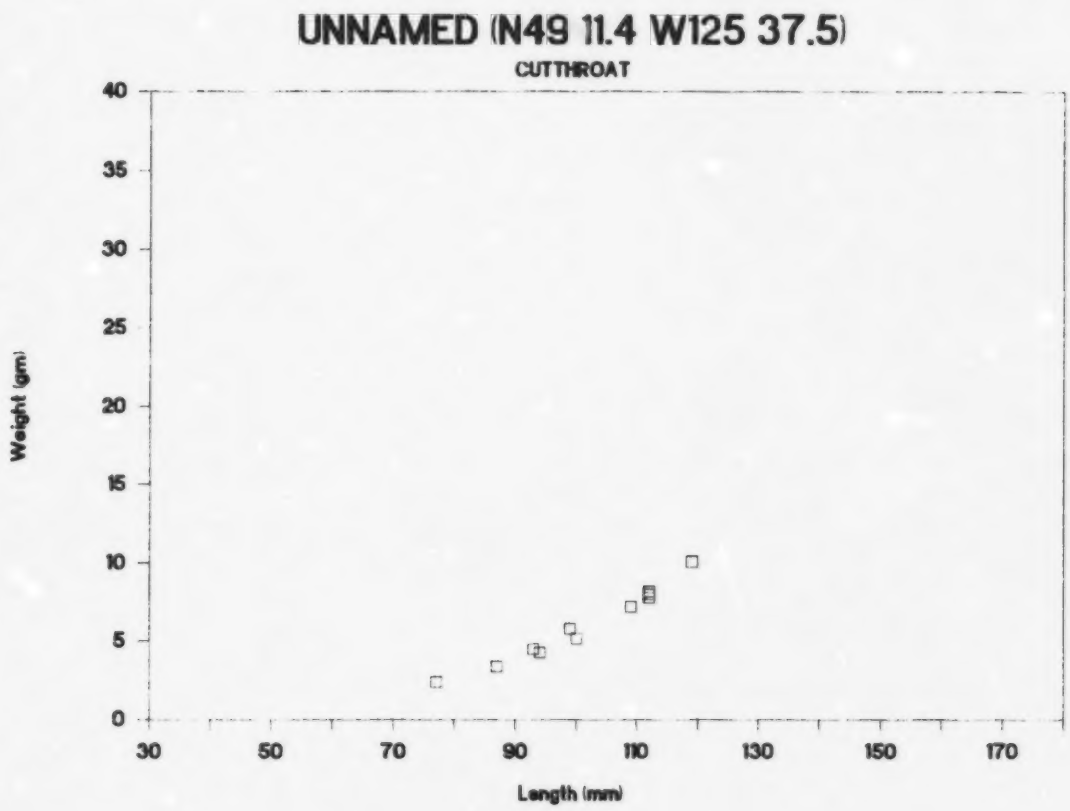
UNNAMED (N49 10.6 W125 41.8)

CUTTHROAT




UNNAMED (N49 10.8 W125 44.7)
CUTTHROAT
Weight (gm)
40
35
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 10.8 W125 44.7)
CUTTHROAT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 11.4 W125 37.5)
CUTTHROAT
Weight (gm)
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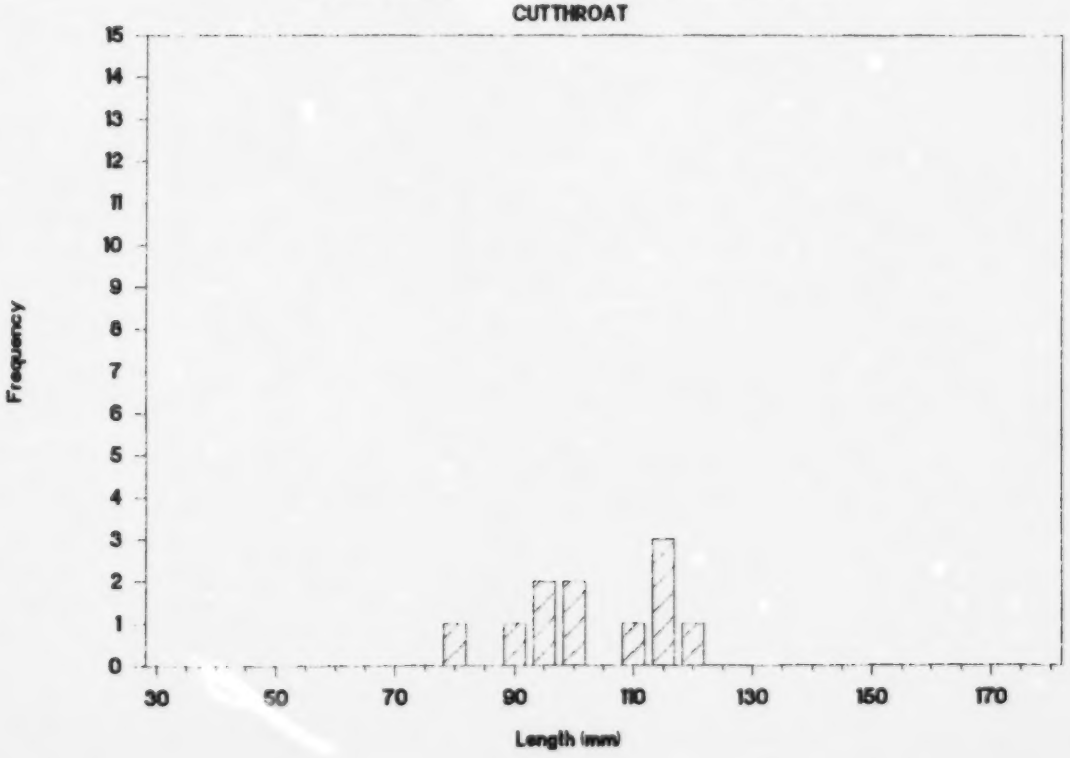
35
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 11.4 W125 37.5)
CUTTHROAT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
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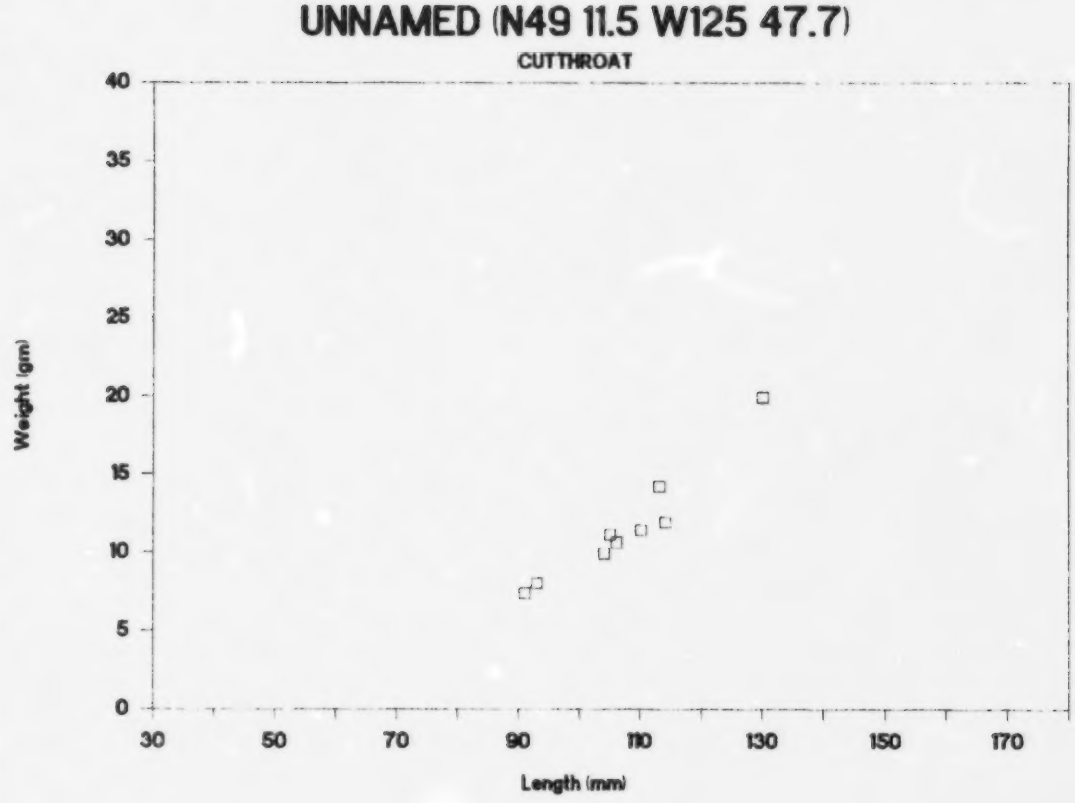
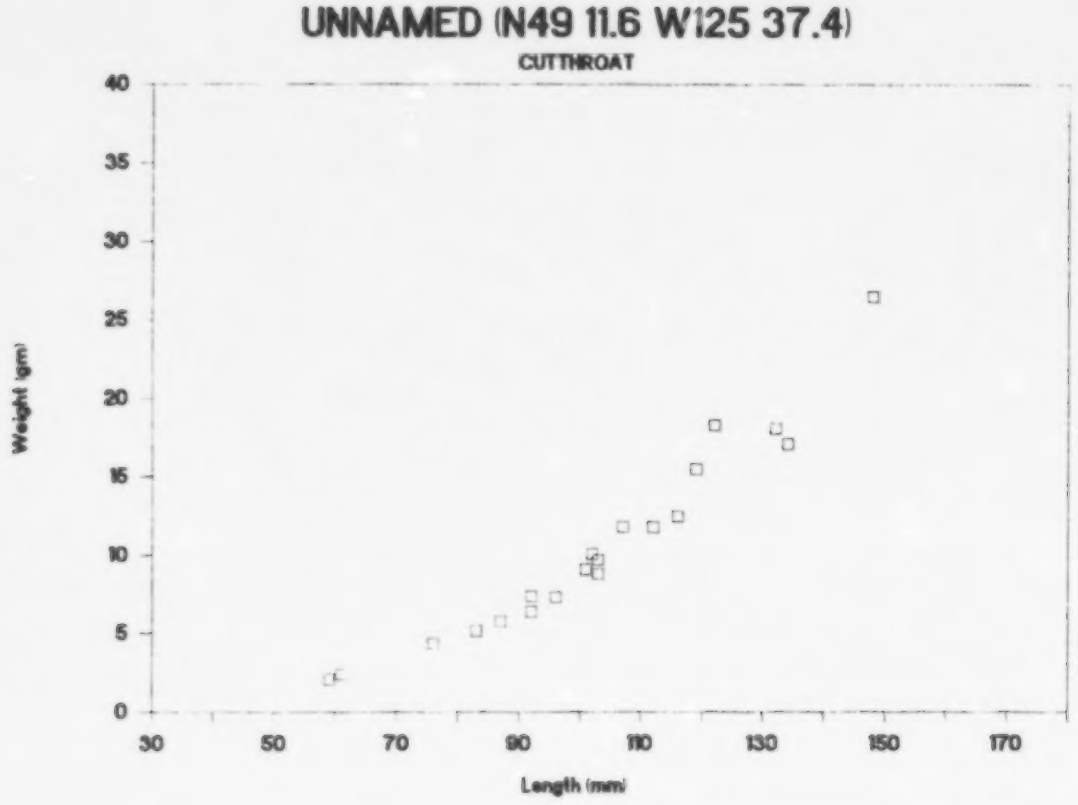
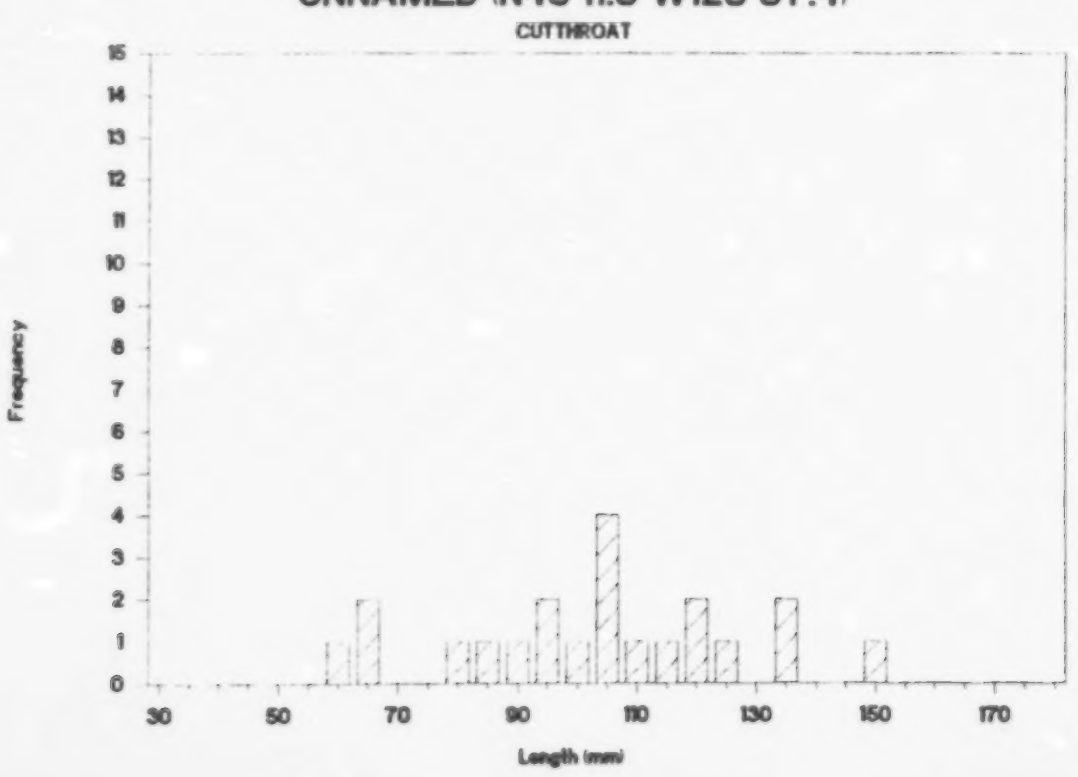
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 11.5 W125 47.7)
CUTTHROAT
Weight (gm)
0
5
10
15
20
25
30
35
40
30
50
70
90
110
130
150
170
Length (mm)

UNNAMED (N49 11.5 W125 47.7)
CUTTHROAT
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180
Length (mm)


UNNAMED (N49 11.6 W125 37.4)
CUTTHROAT
Weight (gm)
Length (mm)
0
5
10
15
20
25
30
35
40
30
50
70
90
110
130
150
170


UNNAMED (N49 11.6 W125 37.4)
CUTTHROAT
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30
50
70
90
110
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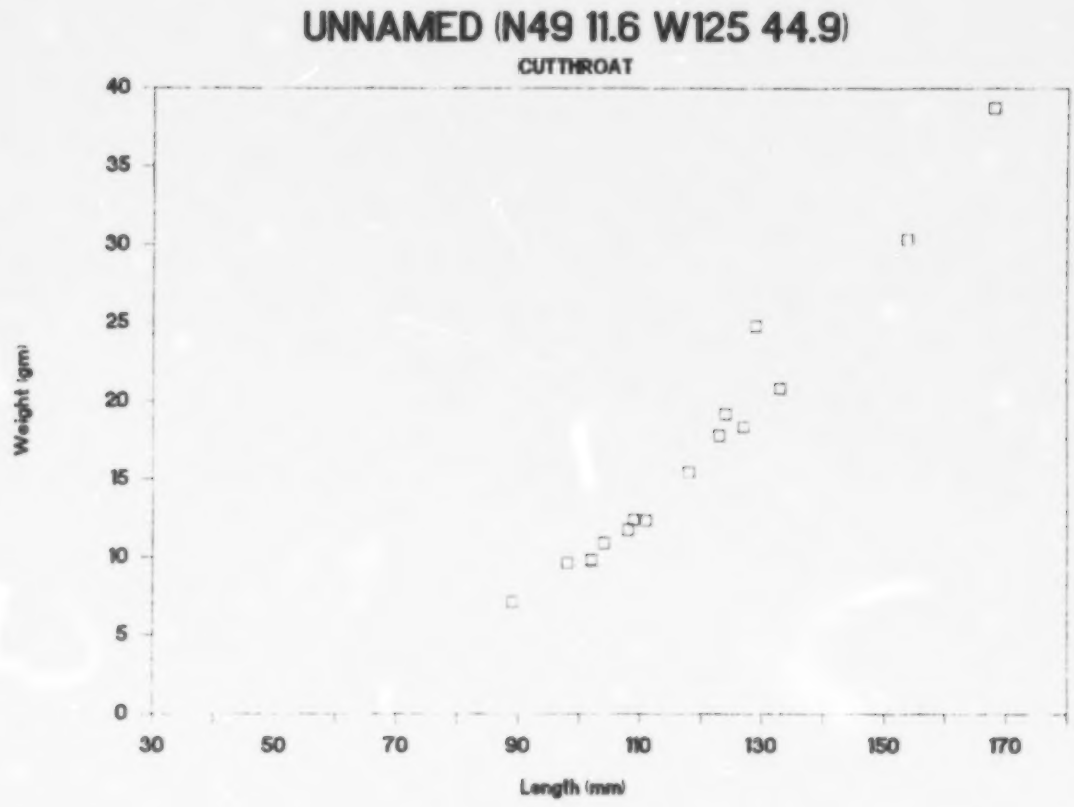
150
170


UNNAMED (N49 11.6 W125 44.9)
CUTTHROAT
Weight (gm)
Length (mm)
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10
15
20
25
30
35
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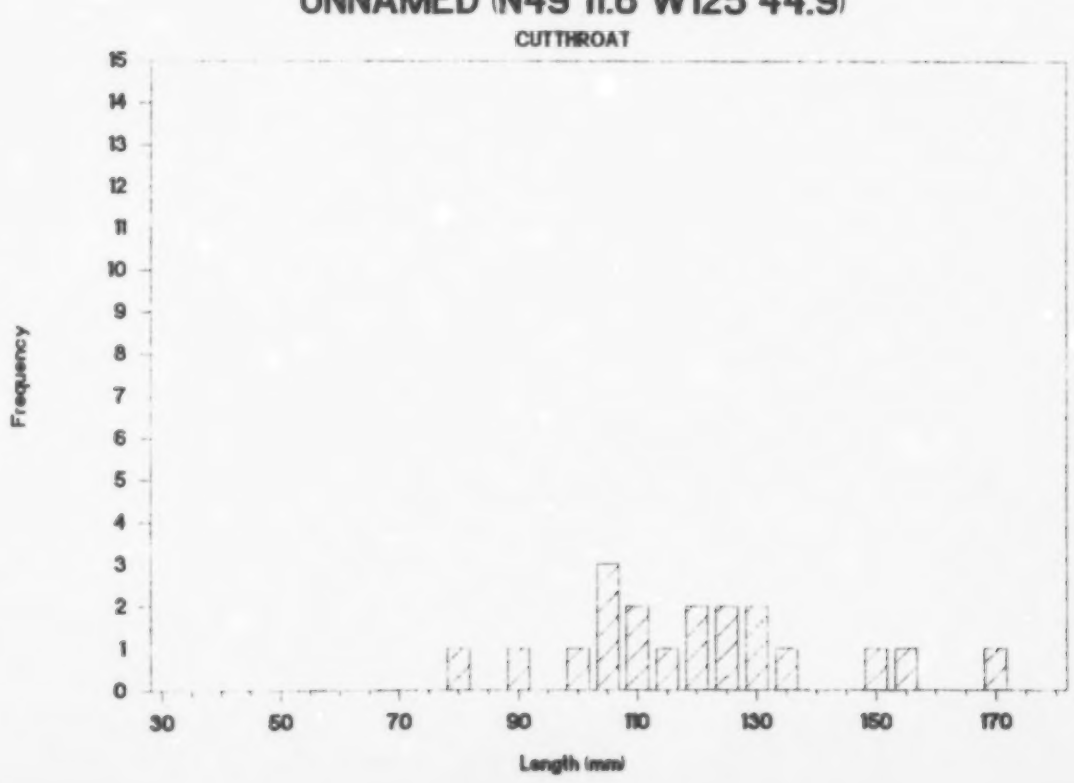
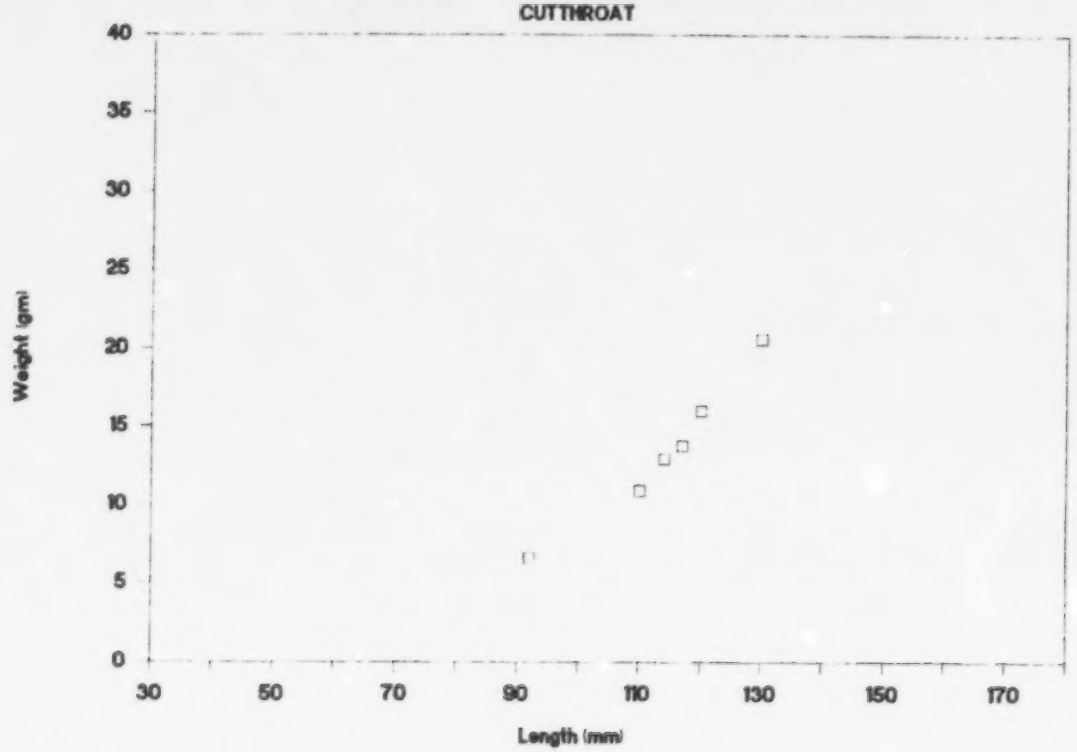
30
50
70
90
110
130
150
170


UNNAMED (N49 11.6 W125 44.9)
CUTTHROAT
Frequency
Length (mm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30
50
70
90
110
130
150
170

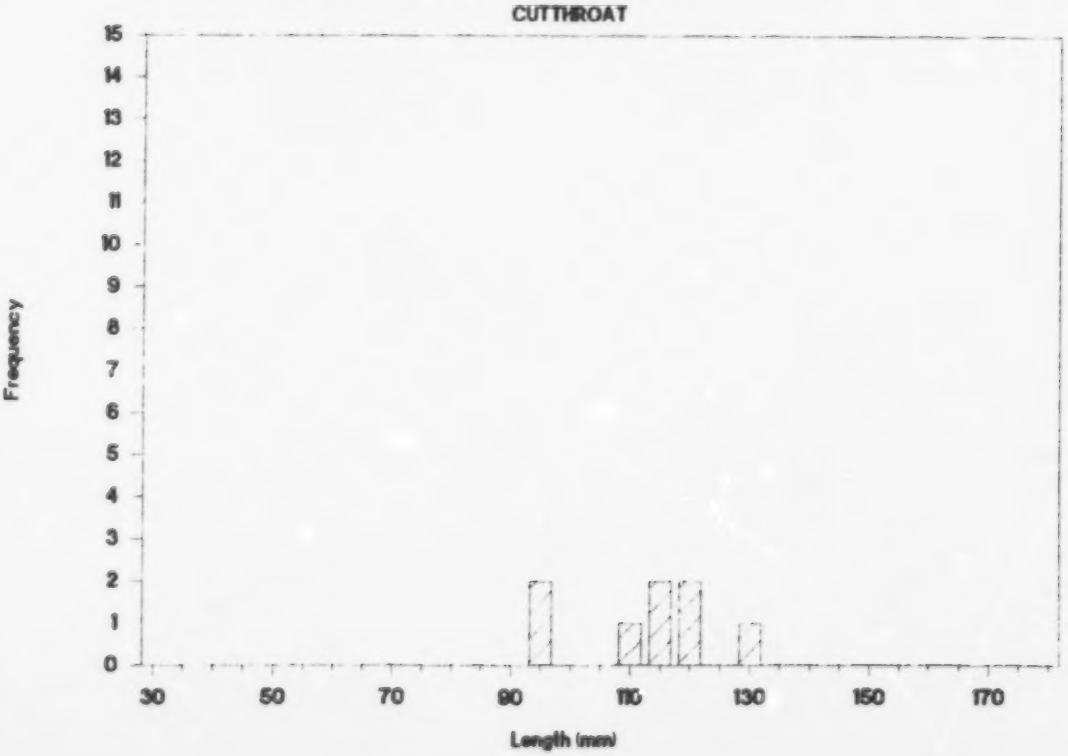
UNNAMED (N49 12.6 W125 45.0)

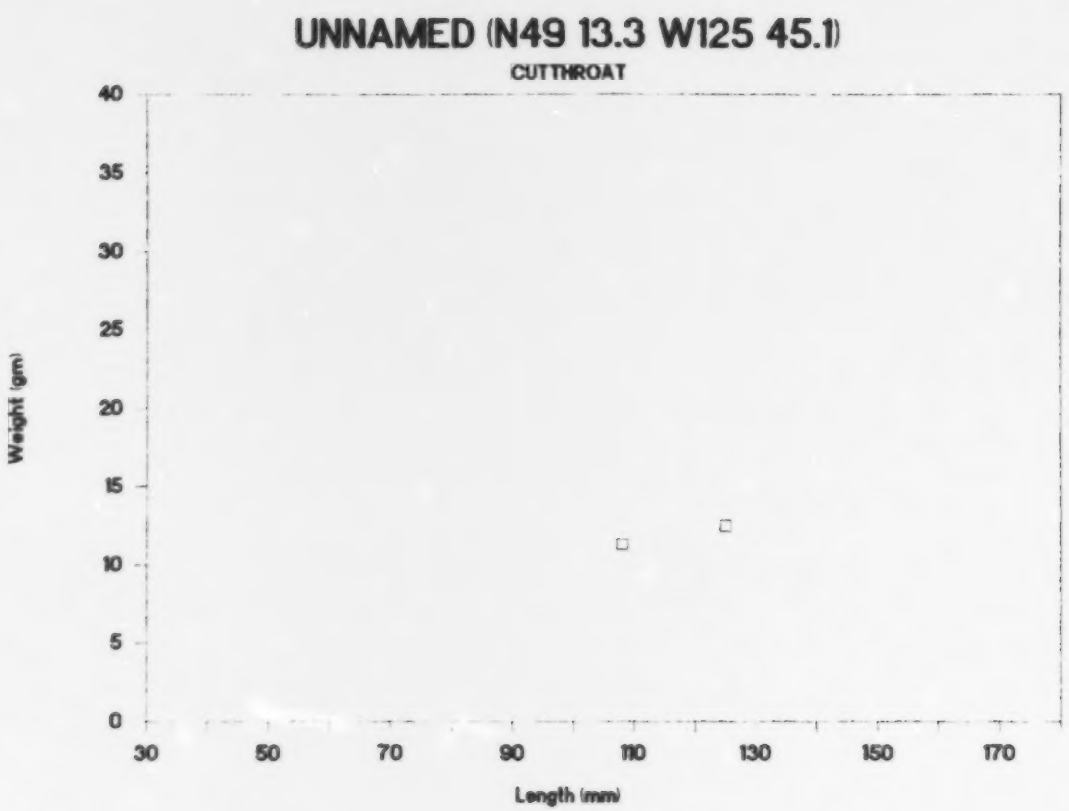
CUTTHROAT



UNNAMED (N49 12.6 W125 45.0)

CUTTHROAT




UNNAMED (N49 13.3 W125 45.1)
CUTTHROAT
Weight (gm)
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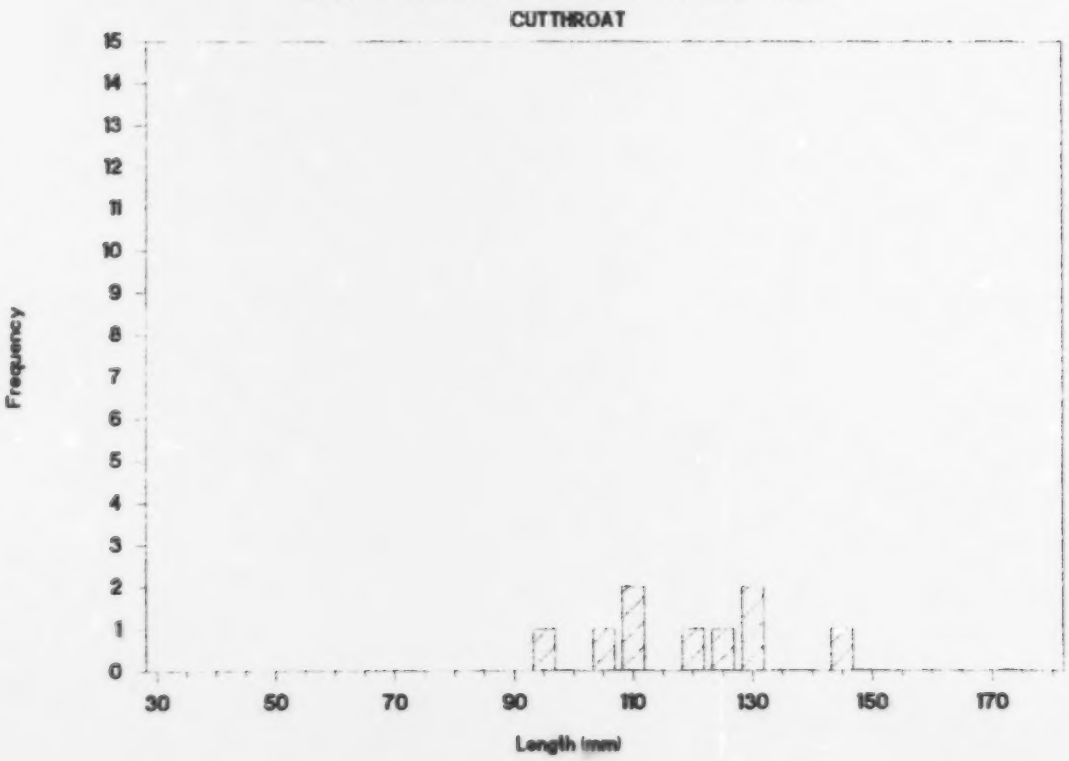
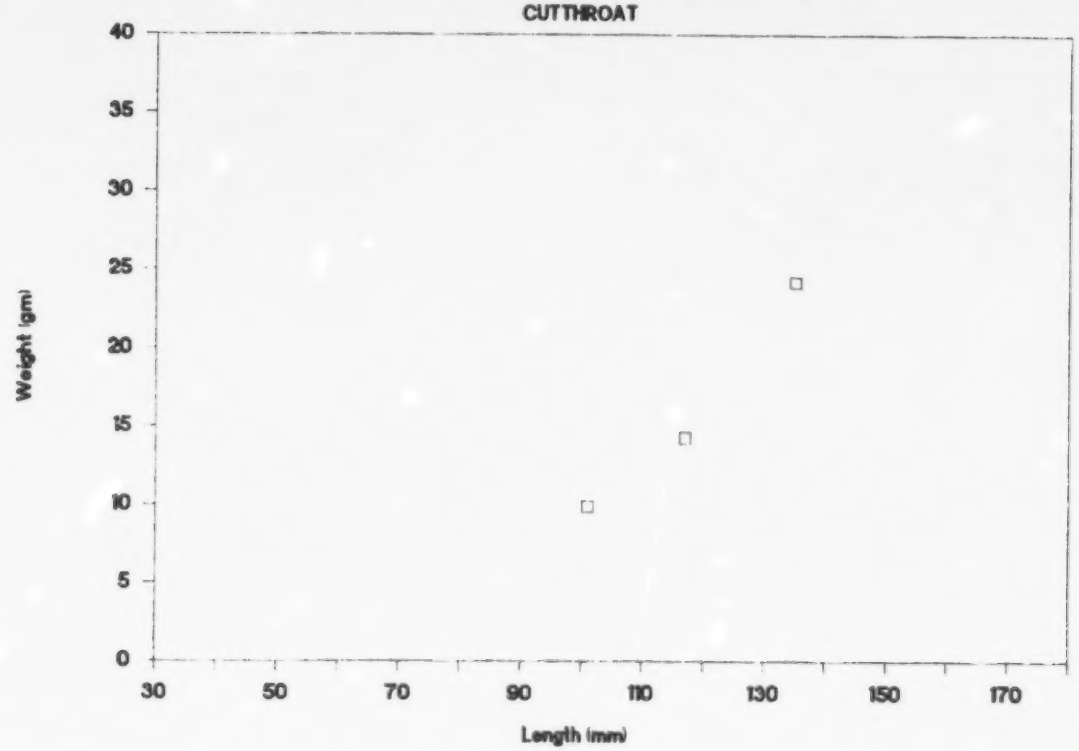
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 13.3 W125 45.1)
CUTTHROAT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
30
50
70
90
110
130
150
170
Length (mm)

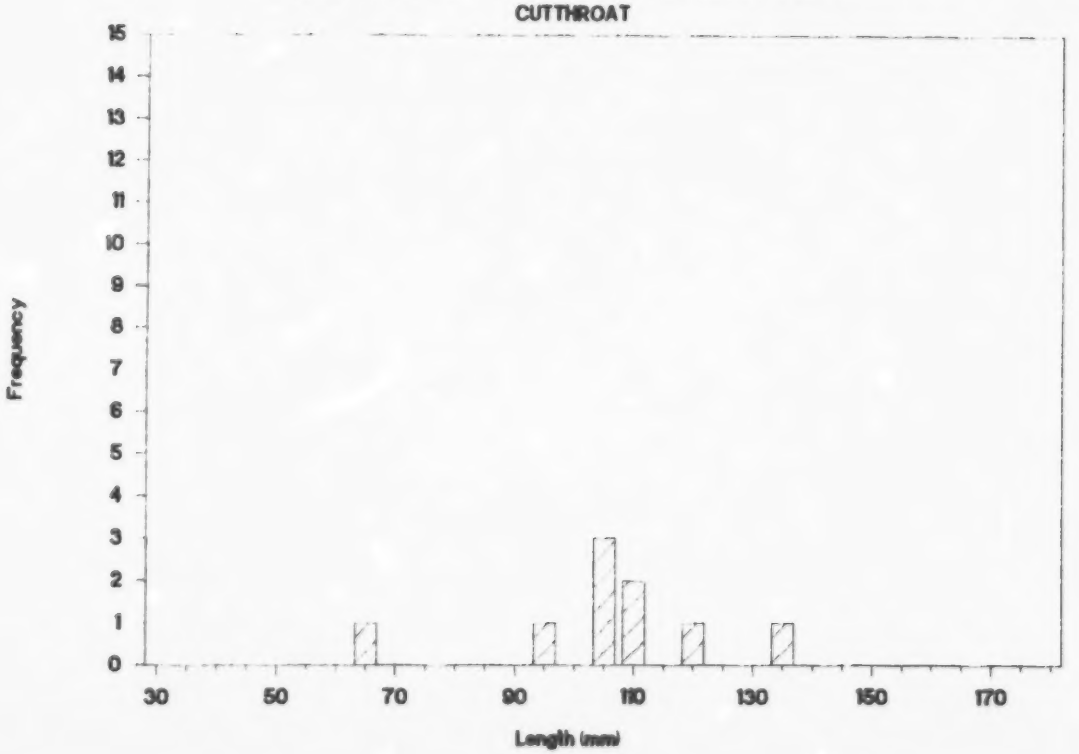
UNNAMED (N49 16.0 W125 43.5)

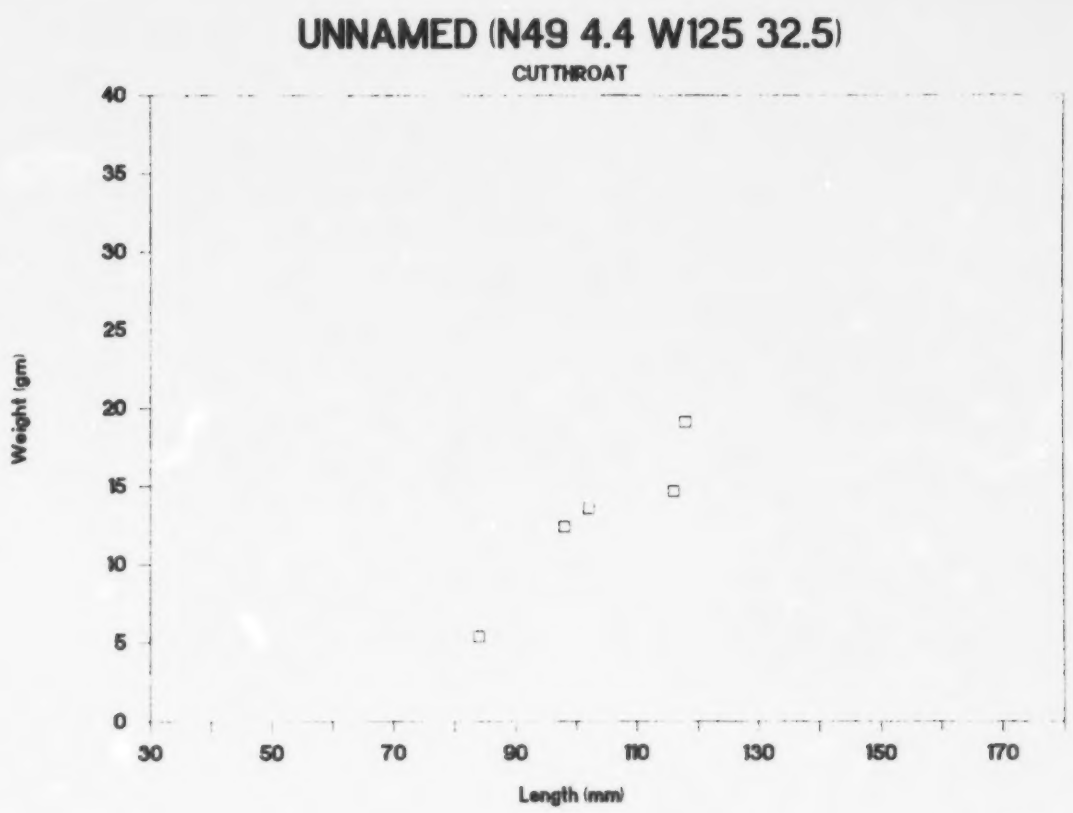
CUTTHROAT

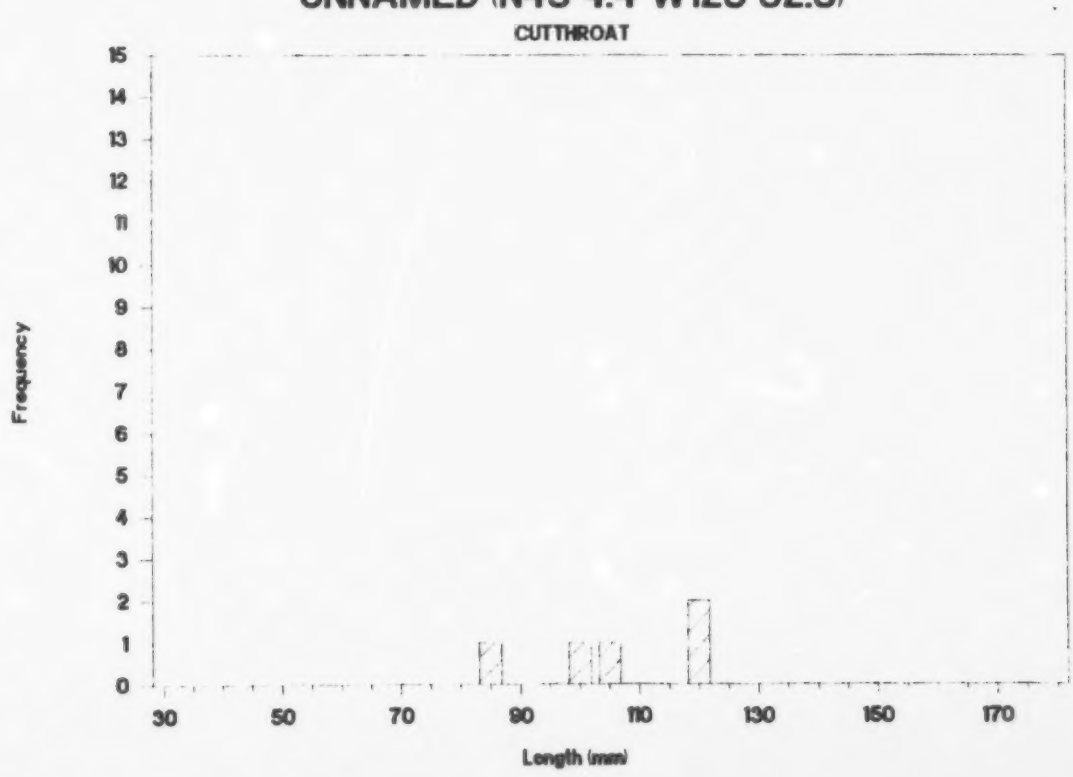


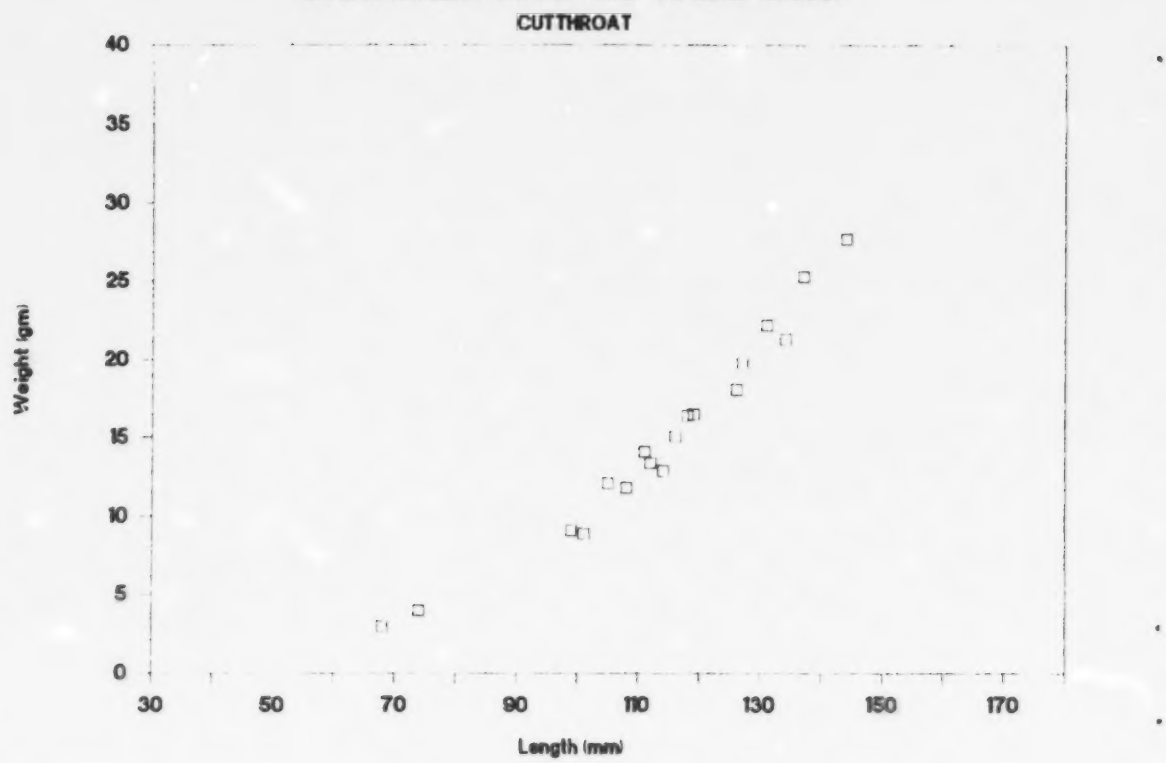
UNNAMED (N49 16.0 W125 43.5)

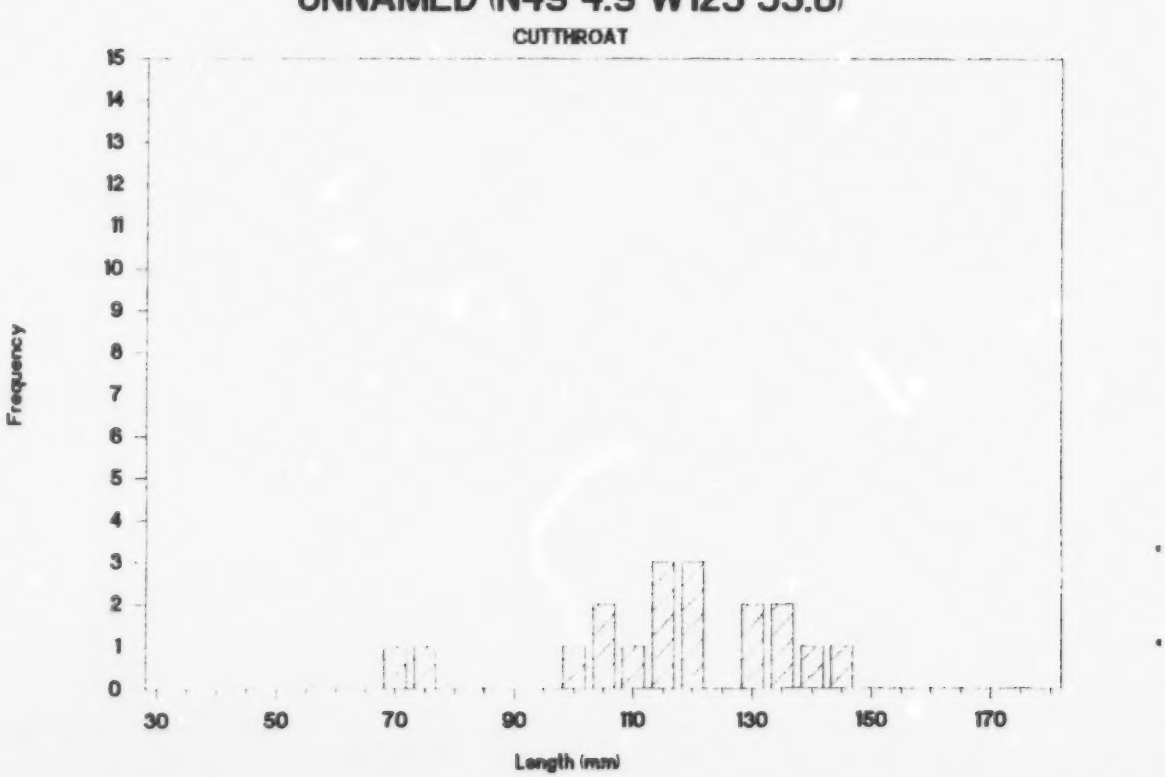
CUTTHROAT




UNNAMED (N49 4.4 W125 32.5)
CUTTHROAT
Weight (gm)
40
35
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)

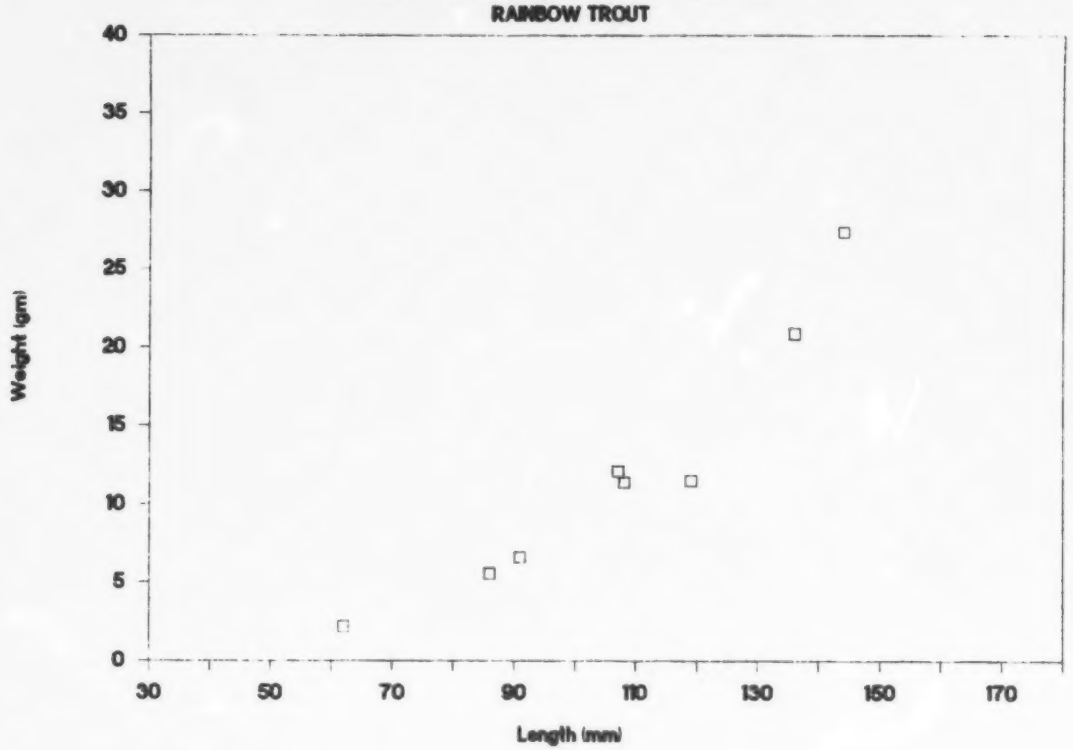

UNNAMED (N49 4.4 W125 32.5)
CUTTHROAT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 4.9 W125 33.6)
CUTTHROAT
Weight (gm)
0
5
10
15
20
25
30
35
40
30
50
70
90
110
130
150
170
Length (mm)


UNNAMED (N49 4.9 W125 33.6)
CUTTHROAT
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
30
50
70
90
110
130
150
170
Length (mm)

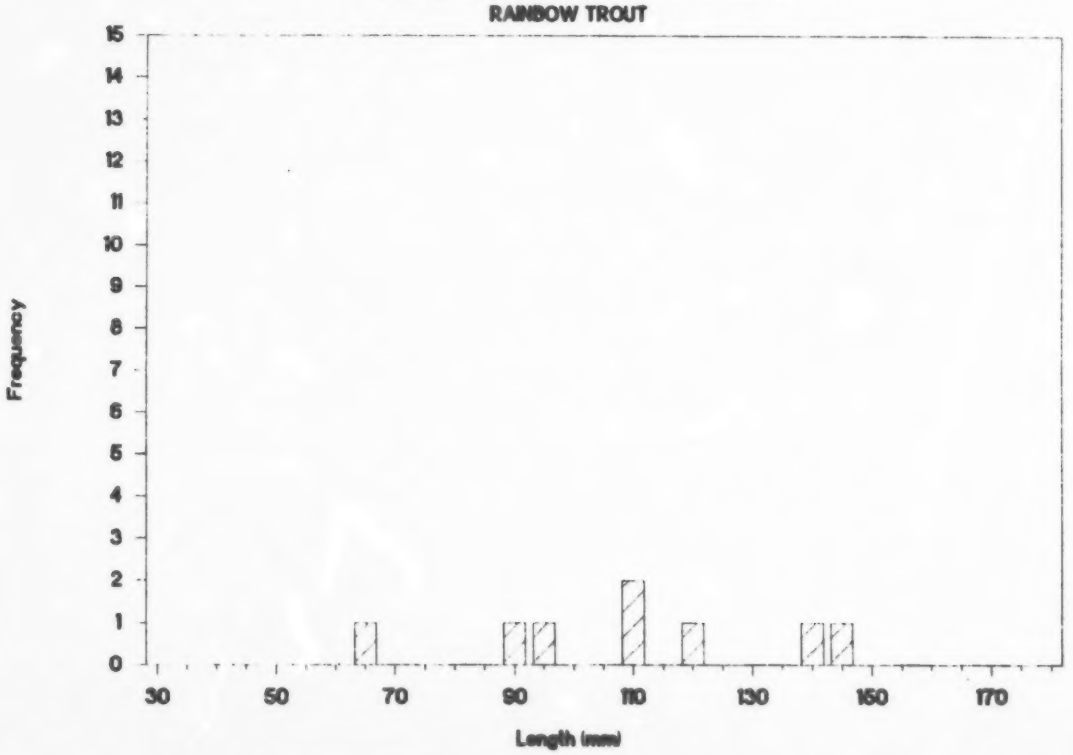
BEDWELL RIVER (4.5 km)

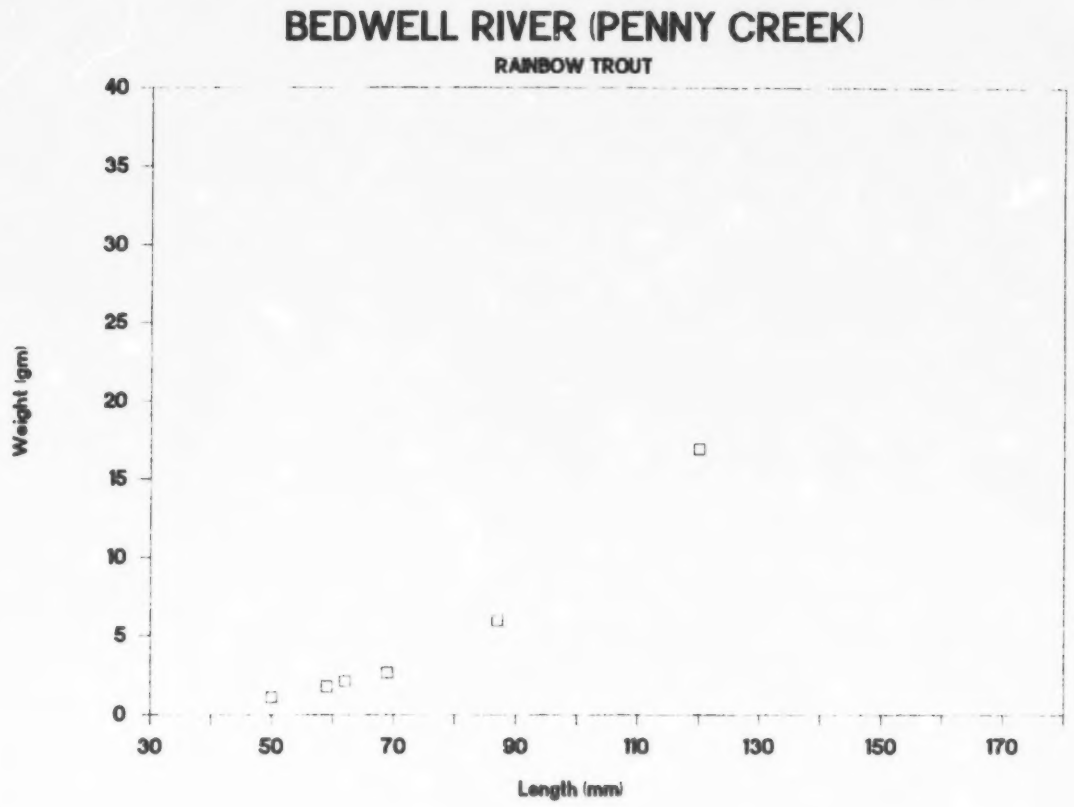
RAINBOW TROUT

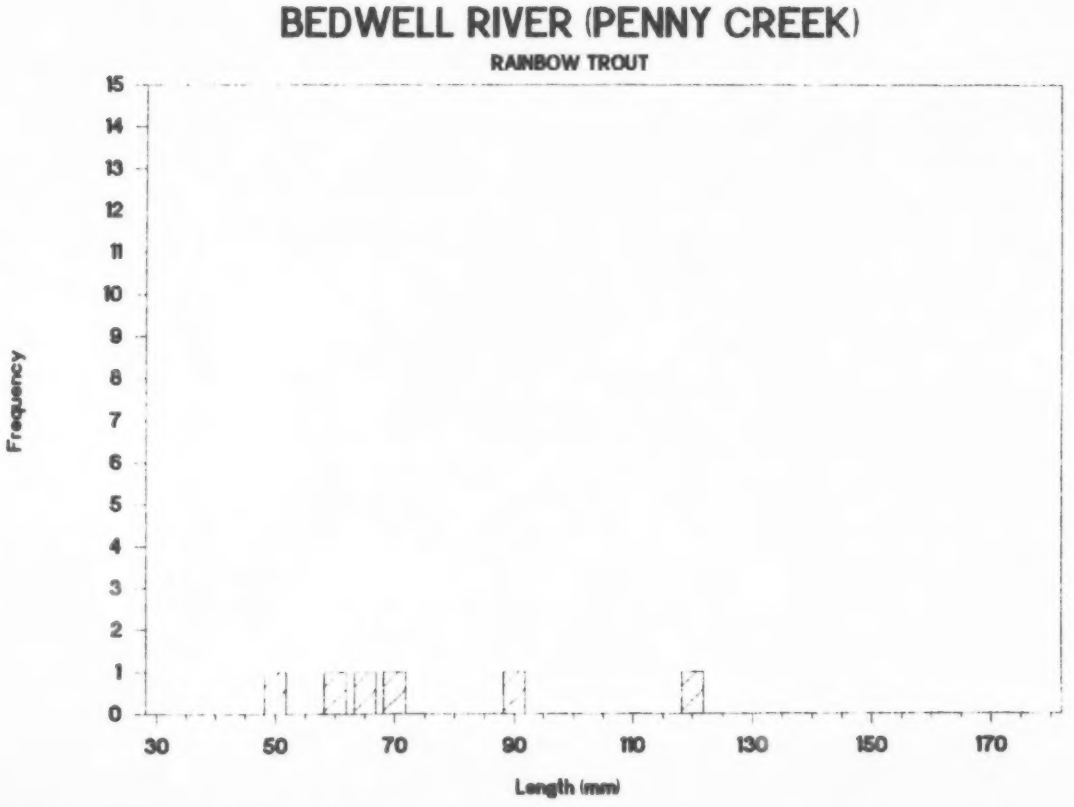


BEDWELL RIVER (4.5 km)

RAINBOW TROUT

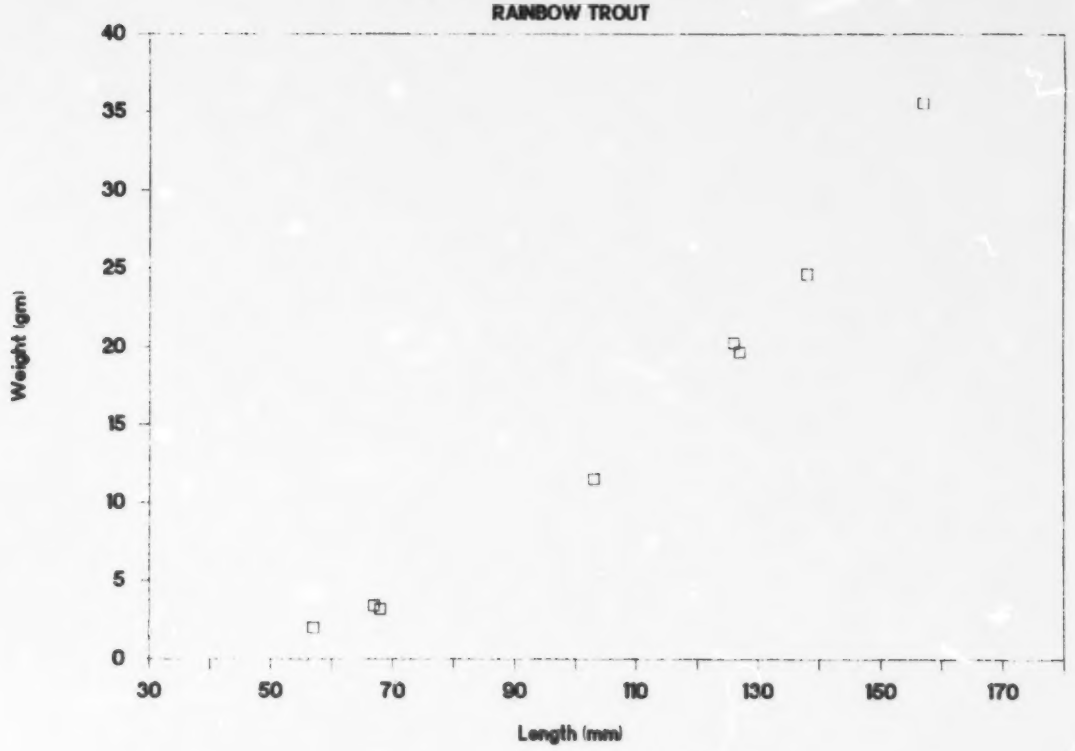



BEDWELL RIVER (PENNY CREEK)
RAINBOW TROUT
Weight (gm)
40
35
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)


BEDWELL RIVER (PENNY CREEK)
RAINBOW TROUT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
30
50
70
90
110
130
150
170
Length (mm)

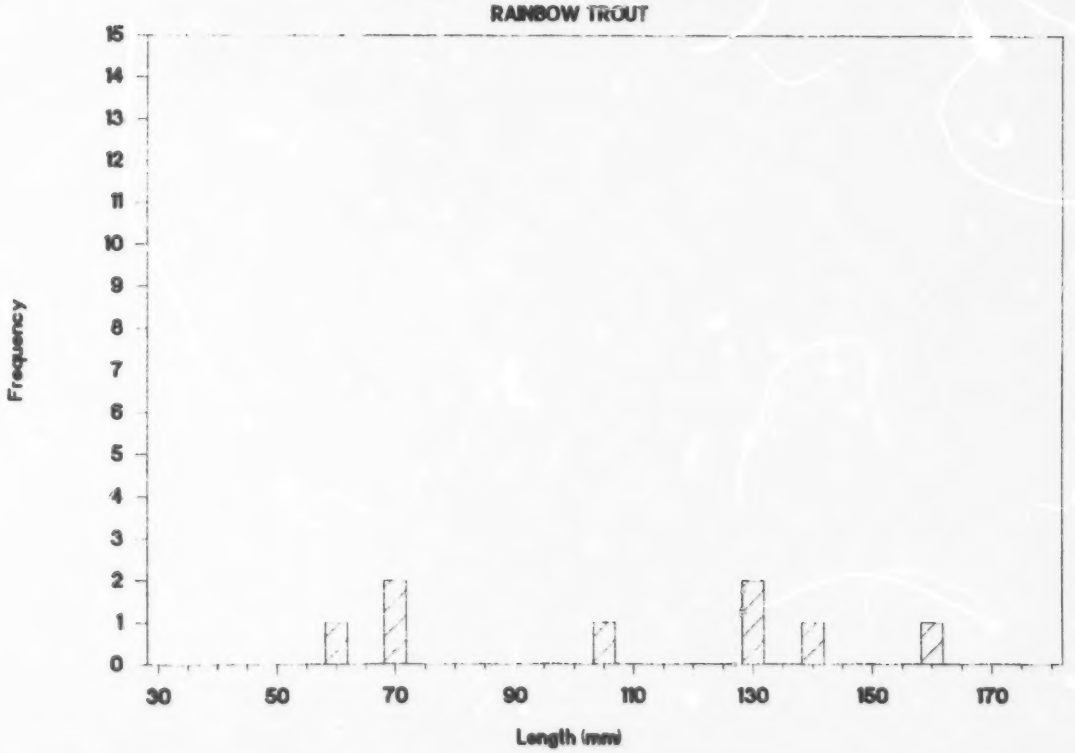
LOST SHOE CREEK

RAINBOW TROUT



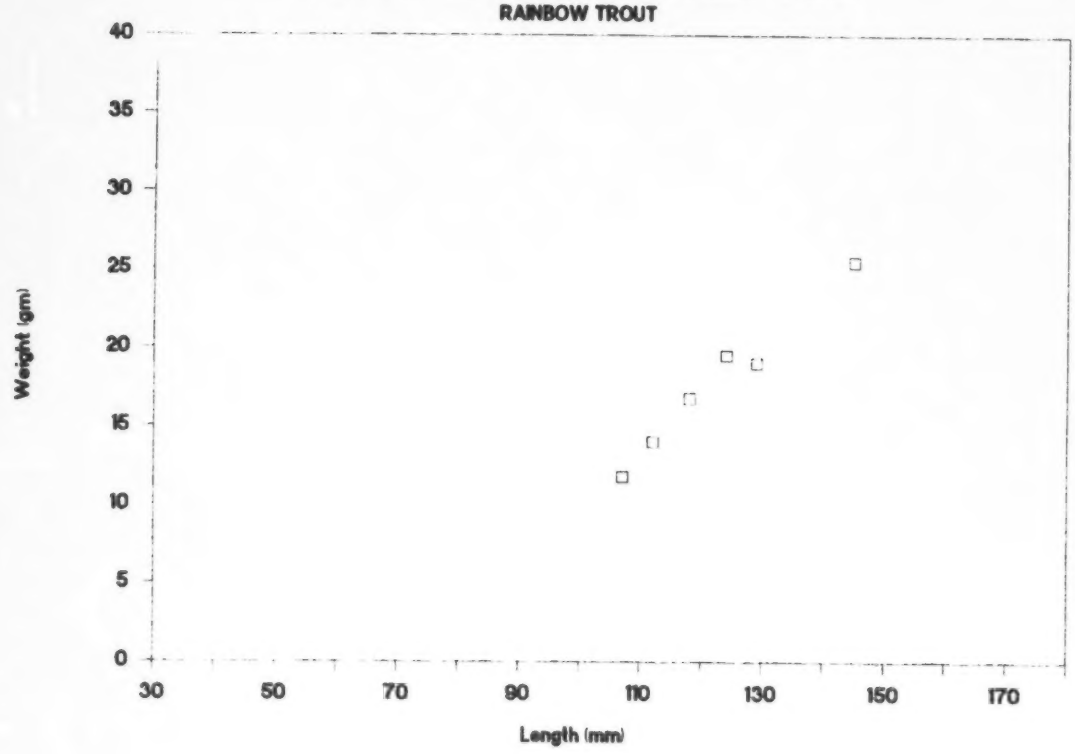
LOST SHOE CREEK

RAINBOW TROUT



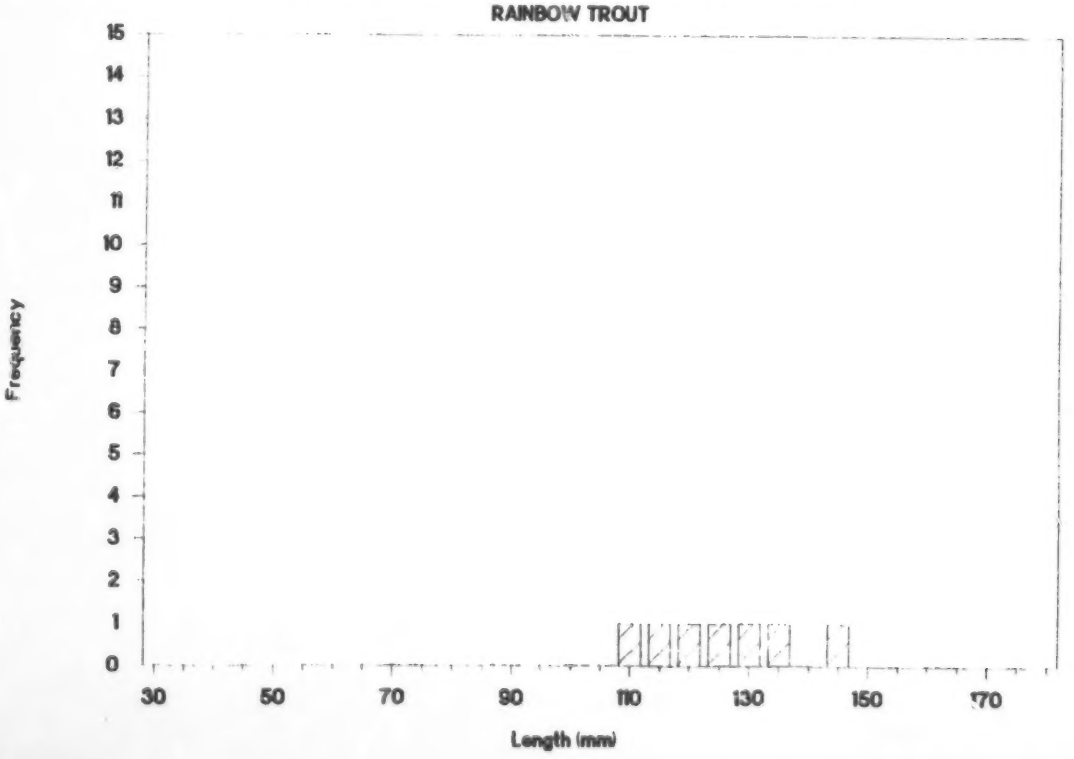
UNNAMED (N49 12.6 W125 45.0)

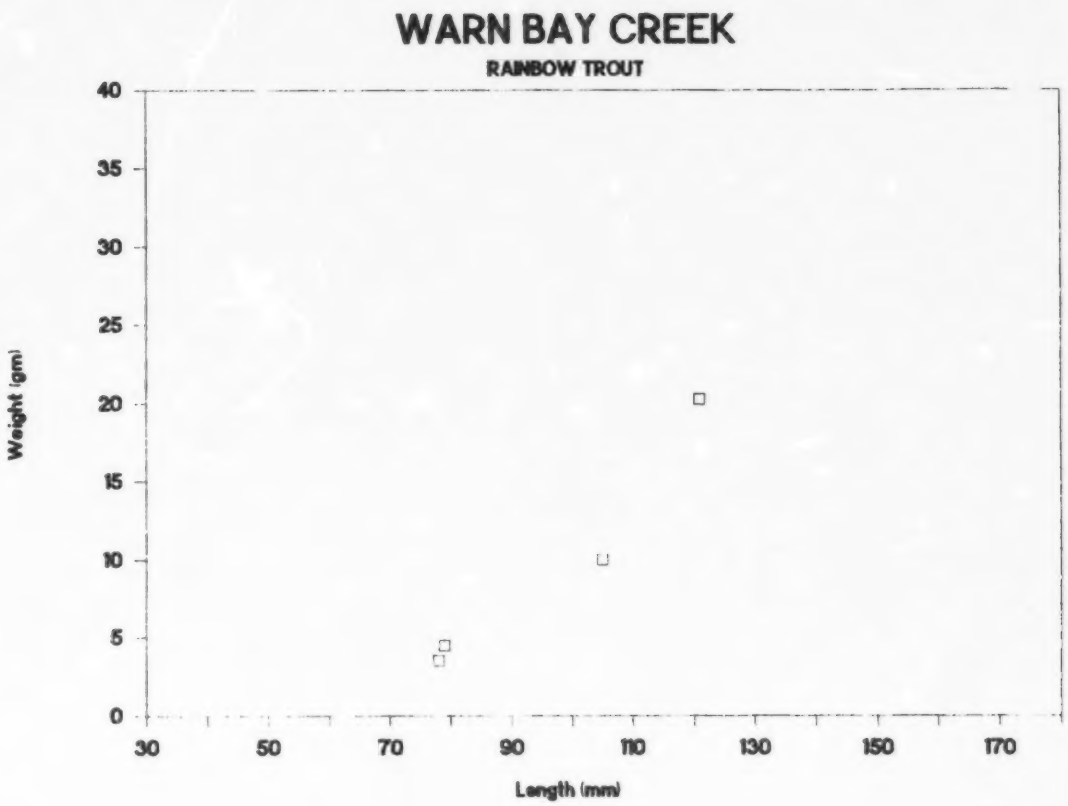
RAINBOW TROUT

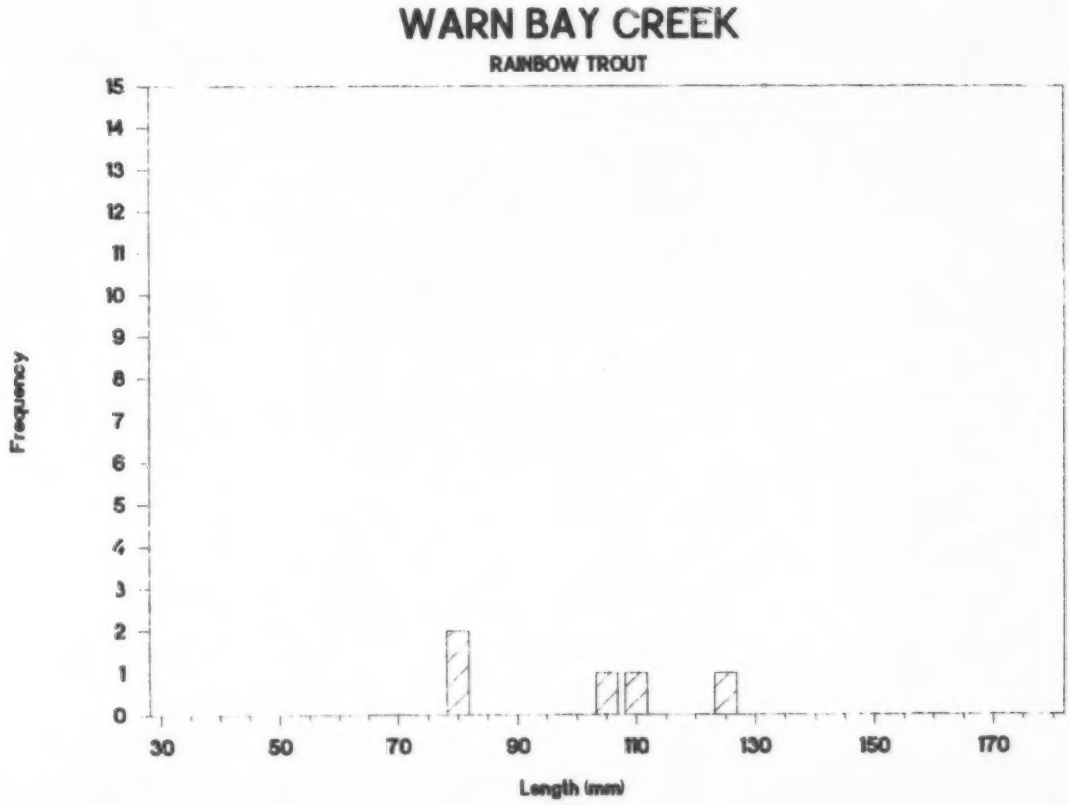


UNNAMED (N49 12.6 W125 45.0)

RAINBOW TROUT




WARN BAY CREEK
RAINBOW TROUT
Weight (gm)
40
35
30
25
20
15
10
5
0
30
50
70
90
110
130
150
170
Length (mm)


WARN BAY CREEK
RAINBOW TROUT
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
30
50
70
90
110
130
150
170
Length (mm)